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IGNORANCE, A LOSS WITHOUT EXCUSE



TAR-GAZING was never more popular than it is now. Yet, notwithstanding this activity in the cultivation of astronomical studies, it is probably safe to assert that hardly one person in a hundred knows the chief stars by name, or can even recognize the principal constellations, much less distinguish the planets from the fixed stars. And of course they know nothing of the intellectual pleasure that accompanies a knowledge of the stars. Modern astronomy is so rapidly and wonderfully linking the earth and the sun together, with all the orbs of space, in the bonds of close physical relationship, that a person of education and general intelligence can offer no valid excuse for not knowing where to look for Sirius or Aldebaran, or the Orion nebula, or the planet Jupiter. As Australia and New Zealand and the islands of the sea are made a part of the civilized world through the expanding influence of commerce and cultivation, so the suns and planets around us are, in a certain sense, falling under the dominion of the restless and resistless mind of man. We have come to possess vested intellectual interest in Mars and Saturn, and in the sun and all his multitude of fellows, which nobody can afford to ignore.—Serviss.

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EDWARD F. BIGELOW
MANAGING EDITOR

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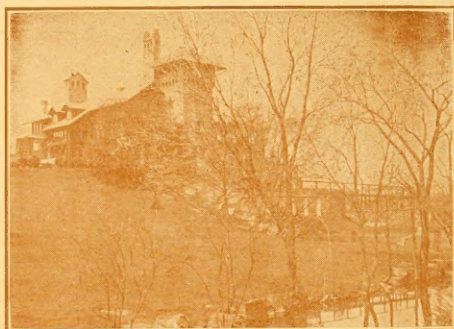
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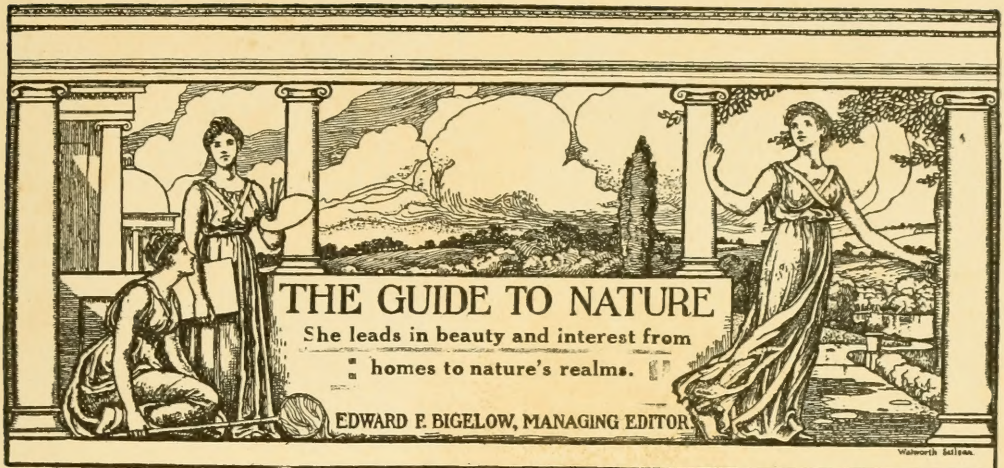
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Volume VIII

JUNE.

Number 1

Concerning Opossum.

BY JOSEPH W. LIPPINCOTT, PHILADELPHIA, PA.

It is, to be sure, an accepted fact that the opossum, our neighbor of the woods, occasionally likes to eat chicken, in fact loves chicken. This has indeed been repeatedly proved in my own hen house, so that if I were ever disposed to question it, I am now convinced to my entire satisfaction.

But there were several questions which, for the sake of those hens, I used to lie awake at night pondering, and one was how did the stealthy fellow manage to take a chicken from the roost and kill it without a noticeable sound coming from it or from the dozens of others roosting all around.

One night I even experimented by pretending I was a 'possum and stealthily trying to take a hen by the neck, as the 'possum himself evidently did, and carry it off without waking the neighborhood. It was an interesting escapade up to the time I succeeded in seizing the hen, then the dust, feathers and squawks convinced me I was all wrong. I tried it again and again, however, and found that some hens didn't seem to mind it; so the trick seemed to depend upon finding a hen that wasn't skittish.

Perhaps it doesn't mean that the 'possum went around patting each chicken to see if it belonged to the scary kind; but I think it may be inferred that the

old fellow was foxy or lucky enough to look around until he found a setting hen or a slow-witted lazy old biddy that roosted on the ground or otherwise separate from the flock.

Sometimes the 'possum does raise a big rumpus among the chickens, a lot of cackling and squawking and disorder that spoils their peace of mind for days afterwards; but two of the particular raids of this kind that I remember, occurred in the depth of the South Jersey pine barrens and two in the Florida sand hill country, both wild places where the 'possums were not used to man's ways—still uneducated. But even there the 'possum did not "cut loose" as a weasel would and kill everything in sight from the rooster down.

It seemed possible that ordinary suburban chickens, never having a chance to see 'possums in daytime, would not know that they were any more dangerous than the neighbor's gray cat, and to test their sagacity I trapped in a box one of several 'possums that I knew lived in a certain set of drains. I should explain here that while I always took the animal census of the woods in tracking time and knew pretty well where each one lived, I respected the 'possums far too much to molest them ordinarily.

The one I dropped in the chicken yard was a big fellow. . . He seemed to know all about the chicken yard, too, for no sooner had I turned my back than up he



THE OPOSSUM AND THE BANTAM.

got from his "playing 'possum" attitude and scurried for the gate some distance away. There were chickens everywhere and they set up a great cackling. Some ran and all kept a safe distance between, but all showed intense interest and closed in behind to respectfully follow him.

A more sheepish expression than that 'possum wore as he continually looked back over his shoulder while being escorted out by the array of fowls, I have never seen, but he did not hesitate until I caught up to him; then he climbed a pear tree. "Now, old fellow, one more test," thought I, so running back to the yard, I caught a tame bantam rooster and placed him in the tree about six inches from the 'possum. He cackled apologetically once and then began to edge backwards and forwards on the limb very alert and full of fighting spirit. The 'possum hardly stirred.

Finally the bantam leaped to a limb close by, flapped his wings almost in the 'possum's sheepish face and crowed, not once but again and again, each time cocking his eye on the enemy to see what effect it had. After that he flew to the ground, crowed again and ran off to tell the admiring hens all about it. I

let the 'possum go free after that; he waited until I was out of sight, then slipped down the tree and scurried all the way back to his drain, brimful of vengeance perhaps, but never to show himself to me again.

I learned one great truth about 'possums and that was that as long as the cover was left off the garbage can at night, not a chicken would they molest, which fact brought me to the firm conclusion that though they love chickens, they only steal when they have to in order to live and that they are not such bad neighbors after all.

A Pure White Opossum.

Dallas City, Illinois.

To the Editor:

I enclose a photograph of a white opossum which was captured on the shore of Lake Cooper by Mr. William E. Hoskins, of this city. The eyes and ears take this specimen out of the albino type



A WHITE OPOSSUM.

although it has every other characteristic peculiar to that type. It thrives well in confinement and makes an interesting and docile pet.

Very respectfully,

M. TANDY.

What the banker sighs for, the meanest clown may have, leisure and a quiet mind.—Thoreau.

The Cashmere Angora Goat.

The Cashmere Angora goat is a cross between the East Indian Cashmere goat and the Angora goat. The buck, Singapore Billy, the only one of his kind in this country, is owned by Miss Irene Chilton of New York City, having been

Klein's Staff of Greenwich Board of Health. The fat test was 6.8% and the bacterial count was fifty thousand. The bacterial count in cow's milk is fifty thousand in the coldest weather; in the summer it frequently reaches a million. The goat makes a pretty good showing



MR. TODD'S FAMOUS GOAT.

presented to her by Dr. William T. Hornaday of the Bronx Zoological Gardens.

Miss Chilton bred Singapore Billy to some pure bred Angora does and the offspring is now owned by Mr. Walter Todd of Greenwich, Connecticut. They are Billy Singapore bred from the Angora doe, Molly C., and Daisy S., bred from the Angora doe, Susie B.

Mr. Todd has also a grade Toggenburg, a Swiss milch goat. Billy Singapore and Daisy S. are the oldest matured Cashmere Angora goats in the United States at this time; they will be two years old in February of this year.

The milk of Daisy S. and of the grade Toggenburg was tested for the fat and the bacterial count on August 29th, 1914, by Dr. Bennett, Bacteriologist of Dr.

with a bacterial count of fifty thousand in August.

The fat test of 6.8% is almost 2% higher than that of the Jersey cow. It was received two hours after milking, and was tested twenty-four hours after it had been received. Goats have been known to give milk for a period of two years without renewed gestation. The period of gestation is five months.

Goat's milk is easily digested because the fatty globules are so infinitesimally small. It is nearest to mother's milk. In time, when people become better acquainted with the goat, the milk will be used for infant feeding. Goats are immune from tuberculosis.

The goat is a useful animal but is despised by most persons. It is looked upon as a scavenger.



THEY ARE GOOD MILKERS.

Some people have an idea that goats can exist on next to nothing. This is true to a certain extent, but one has to give them the nearest to nothing on which they will thrive.

The best and cheapest way to keep a herd is to turn them out on some cheap brush land. They will clean up the brush in a wood lot as well as it can be done by hand and at practically no cost.

The State of New York stocked the Adirondacks with some eight thousand goats to keep the brush down. As a preventative of fire this is a good investment.

Two invalid sisters, the Misses Wood, went to California for their health. They settled on a small farm near Los Angeles. They traded three Pekin ducks for a young goat. They raised the goat, found it profitable and raised more. At present they are milking twelve does, and obtain on an average thirty-six quarts of milk a day. The milk finds regular customers at twenty-five cents a quart. They figure that a goat costs them a dollar and fifty cents a month.

The Angora and other long haired goats do not give as much milk as the milch breeds, but contribute their fleece as profit. Mohair is the product of the Angora goat. The fibre is coarse, long, lustrous and with little crimp. It is used for the manufacture of braids, felts, linings and plushes. It is also being now used as a substitute for human hair in switches and wigs. Alpaca, Vicuna and Llama, natives of South America, are

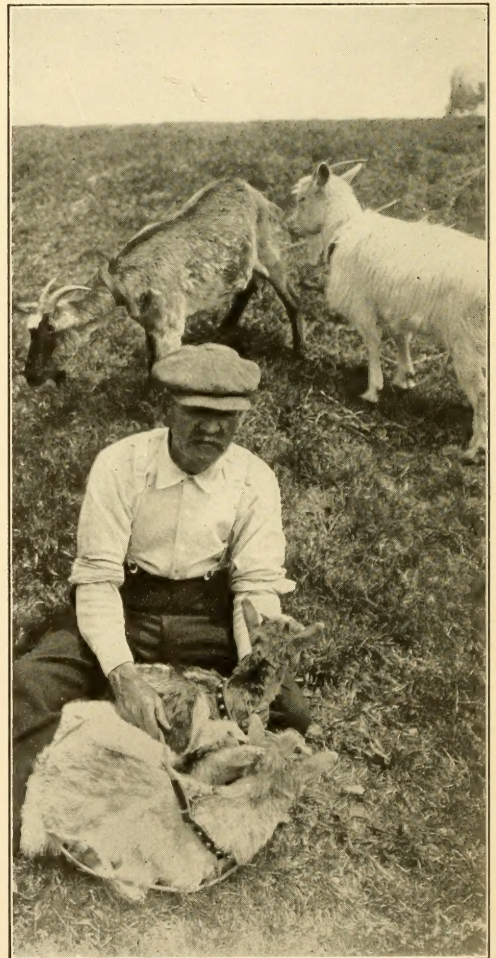
destructive types of goats which produce fibres used to some extent in commerce. The annual yield is uncertain, as the animals are not domesticated. The hair varies in color from white and reddish-brown to black.

When the goat's good qualities are better appreciated, more will be raised. It is a profitable animal.

From an Amateur Goat Raiser.

The much ridiculed goat had been the subject of much thought and discussion until it was decided to give them a trial. The idea was toward production of milk for household use in quantities sufficient and in quarters which prohibited the keeping of a cow.

A few goats were purchased at a very nominal figure, which is point number one in favor of the goat as the initial price



THE KIDS ARE A JOY.

in comparison to a cow in milk production is greatly in favor of the goat. The goat is clean and eats nothing but clean food. It is true they eat the cheapest of things and thrive on them, such as dried leaves—a great delicacy—corn stalks, potato peelings and the like, and it is true they are eccentric in the matter of eating. In milking one day, a lighted cigarette was laid on the ground for the moment, the goat spied it and ate fire, ashes, tobacco and paper, seemingly enjoying it, and without discomfort.

It is of course necessary to keep them tethered or placed in a yard for the purpose as they will damage foliage and nibble at other things not for their use.

The upkeep is scarcely anything, point number two; as stated, they will thrive on almost anything and be productive; they are hardy, only needing a shed in the coldest winter nights. A goat will give as high as four quarts of milk a day, of a very fine quality, almost free from bacteria, and is not subject to tuberculosis. Goats are cunning pets and if treated kindly are absolutely gentle, not showing in the least the tendency for which they are so renowned.

The adults, however, are well able to take care of themselves against dogs, even though tethered. The male must be segregated from the young at birth as he is apt to injure and frequently kill them.

The good points in relation to goats are very numerous and the bad not worth mentioning.

Joseph Grinnel, in *Science* for February 12, puts up a strong plea for the old-fashioned collector who named his birds "with a gun." Eye, camera, and field glass, he admits, are the proper weapons for nine hundred and ninety-nine observers in each thousand. But unless there is a thousandth man to form a permanent collection, and to study it diligently, there will be no accurate knowledge to guide the dilettante. Unfortunately, most of our game laws favor the sportsman who kills and eats, not the man of science who kills and studies.

Was the city girl in the country wholly mistaken when she interpreted "R. F. D." as meaning "Room for Development?"—The Youth's Companion.

Two Tree Studies.

Kearneysville, West Virginia.

To the Editor:

I am sending you two snap shots from Berkeley County, West Virginia. One is of an oak and a walnut tree that



TREE STUDIES FROM WEST VIRGINIA.

seem to be one tree. The larger is the walnut. The other picture shows a large oak completely covered by a grapevine that winds around it.

Sincerely,

SAMUEL G. WILLIAMSON.

Morton L. Clark, of the Amherst, Massachusetts, Experiment Station, describes in *Science* for January 22, an ingenious device of his invention for counting small seeds. A short pipe, about a quarter inch in diameter is filed flat on one side, and along this flat surface are drilled ten holes. Suction on the pipe by a small air pump, causes ten seeds to cling to the ten holes. The size of the holes and the power of the draft have to be adjusted to the particular seeds; but the method is convenient for any smooth object.

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SEA BASS TAKEN WITH ORDINARY ROD AND REEL.

This is not a fake photograph but a real bass much larger than the woman that caught it with a light rod and reel.

Photograph by Professor Charles Frederick Holder. Cut by courtesy of the "Outer's Book."

A Monster Black Bass.

We here present an impressive illustration of a monster black bass that was taken with ordinary rod and reel. For the illustration we are indebted to an interesting article by Professor Frederick Holder in the "Outer's Book." The author tells us of the joy of seeing one of these ponderous fellows and how it eyed the bait.

* * * * *

"The black sea bass, or *Stereolepis gigas*, as the scientific men call him, is a ponderous fellow, yet I picture him as a most graceful creature. Only the day before Pinchot and I had been drifting over a great rock which rose from the slope of the sea mountain in deep water. I was lying flat on the deck, gazing down into the depths, wondering at the variants of blue, the splendid tone that appeared to pervade everything, when suddenly I became aware that I was looking directly at something moving. It was tinted blue, the same hue as the sea, and the algae-covered rock; then I saw that I was looking at a big black sea bass in its native lair, not ten feet below me and as distinct as though it had been laid out on the beach.

"I called the attention of my companion to it, and for several minutes we watched the 'king of the bass.' My bait was in a cleft of the rock and doubtless the fish had scented it like a hound. Its movements suggested caution, suspicion and cunning to a more remarkable degree than I should have believed.

"Such a monster of a fish, at least five or six feet in length and proportionately robust, might have been supposed to have an appetite to correspond and to have rushed at the lure, a shining sardine; yet it did exactly the reverse. It would come up out of the blue waters, swim along with the greatest dignity, passing over the bait, then return, eyeing it cooly, with all the cleverness a trout is supposed to possess, all in all, presenting an attractive and fascinating spectacle."

Professor Holder says that some of the largest bass are captured with rod and reel. "Even ladies have taken some of the largest bass ever hooked, as Mrs. Everett of Los Angeles, who landed with rod and reel a colossus which weighed four hundred and sixteen pounds. I once had the pleasure of seeing her play one nearly as large."

Think of playing with ordinary rod and reel a fish weighing almost a quarter of a ton.

Fear of Our Woods.

BY KATHERYNE SIKKING, SECRETARY
LOUISVILLE GIRLS' HIGH SCHOOL
CHAPTER, LOUISVILLE, KY.

There are few dangers in the Kentucky woodlands, and these few may be easily overcome. It is impossible for us to enjoy the woods until we have driven these fears "into the dark of the moon."

We, the pursuers, often become pursued and driven back to the well-worn footpath. Every time a bird cries in alarm or a mouse squeaks in pain, or a rabbit leaps in fear from beneath our feet, we too, jump and run if our fears are not allayed. From those who fear the woods, nature withholds her mysteries.

Let us go into the woodland with one who knows its dangers. We go boldly ahead until the woods become denser; here the tree trunks are enveloped in a mass of hard stems from which hangs a three-leaved foliage; in the axil of those leaves are dull whitish berries. The leader calls out in alarm as some one starts toward the vine. What is the trouble? Only poison ivy, harmless if you keep away from it.

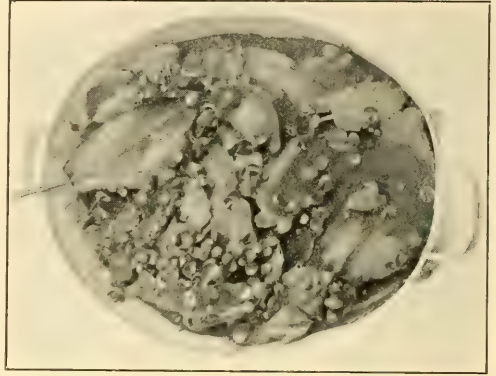
At another time we walk near a swampy tract where one plant in particular predominates. So beautiful is it that we are tempted to fill our arms with its brilliantly colored leaves. Our desire is a rash one, for this, with its dull gray bark, red leaf-stalks, feather-veined leaves, rather far apart with the bright red berries, is the poison dogwood, the most dangerous plant of our country.

If we cared to know the plants the wood fear could be blotted out in a short time. We might go to a botany or a plant guidebook and read of the structure of the poisonous plants, but such plants are not so well remembered as when observed in the woods. There are several magazines in which we can find such things discussed in so original a way that we soon learn to know them. As a suggestion, ask for a copy of THE GUIDE TO NATURE. What is this? A magazine, best described by this quotation: "She leads in beauty and interest from homes to nature's realms."

THE PLANT WORLD UNDER CARE

Plants Growing From Leaves.

Leaves seem about the last thing from which one would ever think that plants might grow. One would as soon think that a plant might spring from the bark. Leaves are the temporary servants of the plant, attending it during its period of growth, but when they have outlived their usefulness, they wither and fall. It therefore seems especially astonishing that in the variety of Nature's methods she has in some plants acquired the habit of producing subsequent generations from the leaves.



THE LEAVES GROWING NEW PLANTS IN A PAN OF EARTH.



THE BRYOPHYLLUM DROPS ITS LEAVES TO GROW NEW PLANTS.

The live-for-ever plant, *Bryophyllum calycinum*, has this habit. The leaves fall when they are still green and in good condition. When they touch the ground or perhaps even before they fall, the growth of tiny roots begins along the edge. If these rootlets reach moist earth, an upward shoot soon appears and develops into a large and beautiful plant, sometimes called the chandelier plant on account of its numerous branches.

Another remarkable characteristic mentioned by Bailey, the well-known botanist, in his "Cyclopedia of Horticulture," is that the leaves of the *Bryophyllum* are sour in the morning, tasteless at noon and bitter toward evening. He attributes this to the absorption of oxygen at night and its disengagement in daylight.

We suggest that our readers secure leaves or specimens of this plant for experiment.

We will mail, well packed and post-paid, a leaf from which several plants may be grown, for twenty-five (25c) cents. Address The Agassiz Association, ARCADIA: Sound Beach, Conn.

* * * * *

A leaf will be sent to any present subscriber who will send a dollar for a new subscription for one year.



SEVERAL *PHYLLIDUM* PLANTS MAY BE GROWN FROM ONE LEAF.

An Interesting Twining Root.

BY DR. GEORGE T. STEVENS, NEW YORK CITY

Plants such as bear flowers and fruit, grasses, the common field plants, trees and others, are characterized by certain general forms of their three principle parts. These three parts are the stem, the leaves and the root. There is a diversity of form for each of these structures depending largely upon the species of plant. To the features of only two of these parts is attention called here.

First, if we examine the stems of many plants, we soon find that we may, in a pretty general way, divide them into three groups. These groups are the erect stems, such as those of trees, grasses and many familiar plants; then the weak stems, one group of which lies prone upon the surface of the ground, as for example, do the stems of the creeping partridge berry (*Mitchella repens*), or those of the twin flower (*Linnaea borealis*); or in a subgroup of these prostrate stems a considerable part may be covered by the soil as in the case of the gold thread (*Coptis trifolia*).

A third group of stems includes those which, although too weak to support themselves, prefer to rise above the soil by the aid of more robust stems or other objects. Familiar examples are the stems or vines of the climbing bean, the hop, the pea and the morning glory.

Here again we find a grouping depending on the method of support. For



A TWINING PARSNIP.

example, the climbing bean and the hop have slender stems which wind about stronger plants, while the pea, the grape and other vines support themselves by tendrils.

The stems which wind about the supporting object are, in nearly all cases, characterized by the fact that all stems of a given species wind in a single direction. Thus, the morning glory winds always from the left to the right as it ascends, while the stem of the hop as it ascends winds to the left. Such twining stems are said to be voluble.

If the stem of the morning glory, the bean or the hop finds no other support about which to wind, it seeks a neighboring stem and the two wind about each other and thus, in some measure, form mutual support.

There are also some pretty clear groupings in the form and arrangement of roots. Thus we have the pivotal root of the carrot, the tap root, and the fascicular roots of grass.

Voluble roots, twining roots, are so rare that I have thought it worth while to show a photograph of a pair in which the twining is as regular and as perfect as it would be found between two stems of any twining plant.

The photograph of the specimen here shown is that of a parsnip. Dining recently with a lady in New Haven, I observed the specimen arranged as an object of interest in the fruit dish. The lady kindly gave it to me and I am in turn presenting its picture to the readers of THE GUIDE TO NATURE.

It will be seen that the tap root of the parsnip divides near its origin into two roots and that these two branches at once assume the nature of twiners and continue this characteristic to the end. The thickness of the root before division is two and one-eighth inches and the length of the specimen is nine and one fourth inches. There are ten full turns of each of the members.

Very rarely do roots assume the voluble character and only in rarest instances do we find so perfect a twining as is here shown.

It might be easy to understand why weak stems should acquire the twining character but it would be difficult to guess why these deeply penetrating roots should assume the habit of twiners unless in imitation of above ground voluble stems.

* * * * *

[By a curious coincidence, just before your letter was received, there came from the kitchen of my home a similarly entwined carrot. A photograph of this was taken and is shown herewith.—E. F. B.]

The knowledge of an unlearned man is living and luxuriant like a forest, but covered with mosses and lichens, and for the most part inaccessible and going to waste; the knowledge of the man of science is like timber collected in yards for public works, which still supports a green sprout here and there, but even this is liable to dry rot.—Thoreau.

Several different scholars have recently expressed the opinion that the Tree of Life of the Garden of Eden, mentioned in the early parts of Genesis, is the date palm.



THE ENTWINED CARROT.

An Adventurous Ivy Vine.

Seattle, Washington.

To the Editor:

It is a well-known fact that ivy is hard to check in growth, and many people can testify that it will grow up inside of a window casing and out at the top, but it remained for a house in Morton,

in the boards of the entrance building and sent a branch of luxurious growth into the interior in Arcadian picturesqueness.--Ed.

You are producing a marvelous magazine and each number is a joy to any lover of nature.—Ximena McGlashan, Truckee, California.



LIVING IVY THAT MADE ITS WAY THROUGH WALLS AND WALL PAPER.

Washington, to prove that it can pierce wall paper. In this house the tendency to explore led the ivy that covers the outside of the house through the walls into the living room and into the kitchen. At three different places it has broken through the wall paper and is still growing. The illustration shows where it has forced itself into the living room near the clock shelf and already grown long enough to festoon the picture on the adjoining wall.

Respectfully,

HELEN L. BUSHNELL.

In reply to an inquiry in a later letter Miss Bushnell wrote:

"I took the picture myself, and the old lady who lives in the house said that the vine broke through the paper of itself. She cut it off several times and kept it cut off in the kitchen, but finally decided it would make a good decoration in the living room, so let it grow and trained it around the picture."

* * * * *

A rambler rose on the Home Office of The Agassiz Association is true to its name. In its rambles it found a crack

Keeping Lettuce Fresh.

In picking lettuce from the garden, do not cut off the root or even pull it violently from the ground. Instead, lift the plant carefully with a trowel as if for transplanting; then shake the root free of earth without injuring the small fibers.

Wash. Set in tumbler of water, leaves resting on the end; root immersed. In a cool place, the plant will keep fresh for several days, without losing flavor as when the leaves are wet. Plants treated in this way, even though plucked while wilted by the sun's heat, become crisp and edible in a couple of hours.

The device is especially useful in the absence of ice.

Lipman and Fowler report the first successful attempt to isolate in pure culture and directly from the soil the nitrifying bacteria which forms the nodules on the roots of peas, beans, and other legumes.



A Bird Home Among the Cat-tails.

BY EDWIN L. JACK, PORTLAND, ME.

Photographs from life by the Author.

Almost everyone interested in ornithology knows the red-winged blackbird, but owing to the general location chosen by the bird for its nesting site, few people have become intimately acquainted with its "Home Life." For

three successive years a number of red-winged blackbirds had nested in a small swamp a short distance from my home. Their domestic life among the cat-tails appeared so interesting and picturesque to me that this season I introduced my camera into their surroundings and succeeded in obtaining the studies here given:



THE HAUNT OF THE RED-WINGED BLACKBIRD.

The birds arrived at the swamp on the seventeenth of last May, and immediately began the construction of their homes.

On the twenty-ninth, the nest which I had chosen for my photographs was completed, and June fifth it contained four beautiful, light green eggs, thickly marked with irregular scrolls of chocolate around the larger end.

The following day I started for the swamp with a five by seven camera, plates, tripod, long hose, and rubber waders. The location proved most difficult for camera work, but in a short time I had my outfit arranged and secured the study of the nest and eggs here given.

My next attempt was for a study of the female brooding, so I attached the long tubing to the shutter, went off fifty feet and waited; the bird was extremely shy of the camera, regardless of the fact that I had concealed it with reeds. She knew it was no natural part of the landscape, and she simply would not go to the nest. In fear that the eggs would chill, I removed the camera and came to the conclusion that a picture of her was possible only, when the eggs were farther advanced in incubation, or when the young had hatched.

In twelve days, I paid the birds a second visit and, as I approached the swamp; on a swaying cat-tail was perched the female, with what appeared to be an insect in her bill, and I knew that in all probability the young birds had hatched. Leaving the camera on the bank, I carefully worked my way toward the nest. As I neared it, the female flew from one cat-tail to another, uttering her harsh "click--click," while the male, perched in the top of a nearby tree, occasionally sent forth his clear "con-quer-ee—con-quer-ee—". On reaching the nest, my expectations were realized, for it contained three young birds, and one unhatched egg. With all possible haste I arranged the camera, focussed sharply on the nest, attached the long tubing, throwing the bulb back to the edge of the bank, and concealing myself as much as possible, I waited.

It was one-half hour before the female showed the slightest signs of feeding the young. At last, she flew to an adjoining field, and in the



"INSTANTLY UP WENT THREE GAPING MOUTHS AND LONG SCRAGGY NECKS."

course of a few minutes, returned, with a grasshopper in her bill. Flying from one reed to another, and each time going a little nearer, she at last flew to a cattail stock to which the nest was attached. Here, she meditated, scanned the surroundings, and seemingly finding things to her satisfaction, flew to the rear of the nest; instantly up went three gaping mouths and long scraggy necks. I squeezed the bulb, and the click of the shutter sent her flying to the nearest fence post. This all happened in an instant, but in that instant I secured the likeness of the bird here given.

On the following day I made a second attempt at picturing the bird in some desirable attitude in her domes-



A YOUNG BLACKBIRD TWO DAYS BEFORE LEAVING NEST.

tic duties. Having focussed the camera on the nest, I repeated the performance of the previous day; but I had only to wait a comparatively short time, for the bird immediately flew to the nest, this time lighting in full view. I snapped and secured a second likeness, which to me is one of my best pictures of the bird. As the nest was very deep, and only the heads of the young birds would show in a picture, I concluded to wait until they were fully feathered and ready to leave the nest, before photographing them. This meant a period of about twelve days, and during that time I often waited by the hour with my camera focussed on the nest, hoping to secure a study of the male bird.

What a fitting picture he made in the landscape, perched either on the old wooden fence, which bordered one side of the swamp, or swaying back and forth on a cat-tail! But not once during the time I had worked about the nest did he approach within fifty feet of it. He did not appear disturbed or frightened in the least, but evidently he took small part in the rearing of his family.

When it was almost time for the young to leave their nest, there came a rainstorm of three days' duration. On the fourth day it cleared, and in the

afternoon I went to the swamp, only to find the nest empty; and although I searched in vain, not one young blackbird from that nest could be found.

Within forty feet of the nest I had been working on, I located another, which contained one young bird. Its feathers were not fully developed, but not caring to take another chance with the weather, I carefully placed him on the top rail of the old fence and photographed him. It is to be regretted that I did not have two more to place beside him, but this is only a small circumstance in the many disappointments encountered by the "bird photographer."

The red-winged blackbird occasionally places its nest in alder and wild rose bushes, bordering a swamp or stream; but the majority are placed among cat-tails, in swamps.

Just why the bird most frequently selects this location I do not know, but doubtless instinct teaches them, that there in the swamp, the nest carefully hidden among the rushes, with often three or four feet of water beneath, they are safe from four-footed as well as two-footed enemies.

Birds of New York.

By special arrangement, the Massachusetts Audubon Society, 234 Berkeley Street, Boston, is able to furnish the complete set of the plates of the Birds of New York for 57 cents postpaid to any address in the first or second zone. These are complete, just as found in this invaluable book. They figure in color every bird—land or water—that flies over the State, done on a heavy coated paper 9 x 12 in size. There are 106 of these plates and they are enclosed in a neat and serviceable portfolio, the whole in a cardboard box.

The total cost is 57 cents, and the opportunity for bird-lovers is unique.

Tropical Humming Birds.

A London ornithologist has been keeping tropical humming birds alive in special steam-heated cages in which grow orchids to provide nectar for their food. When the supply of nectar fails, the birds are fed on a mixture of honey, sponge cake, crumbs, and infant's food.

The Ancients and Birds.

Among the latest of the publications of Leland Stanford Junior University is Ernest Whitney Martin's "The Birds of the Latin Poets." The author has brought together virtually every mention in Latin poetry of every several bird. These amount to some seventy species in all; and each of these so far as possible, is identified, and in addition, compared with our own American forms.

The striking feature of this work, besides the remarkable learning and industry of its author, is the small knowledge of ancients concerning bird life. They concerned themselves little with their neighbors of the air, and took little delight in them. In this, they seem to have been of like mind with their descendants of to-day, who prefer to eat a robin or a lark to hearing it sing.

Doubtless as the author points out, the fact that the Romans believed that the birds are metamorphosed human children had something to do with their feeling toward them. Nevertheless, they did not always think sadly of the feathered tribes—as witness Horace's famous lines about the duck and his habitat in the "aqua, qua, qua, qua, qua!"

A tern, ringed in the Farne Islands, almost at the north of England, in July was captured the following February on the African Gold Coast almost under the equator.

Trinity Churchyard a Bird Refuge.

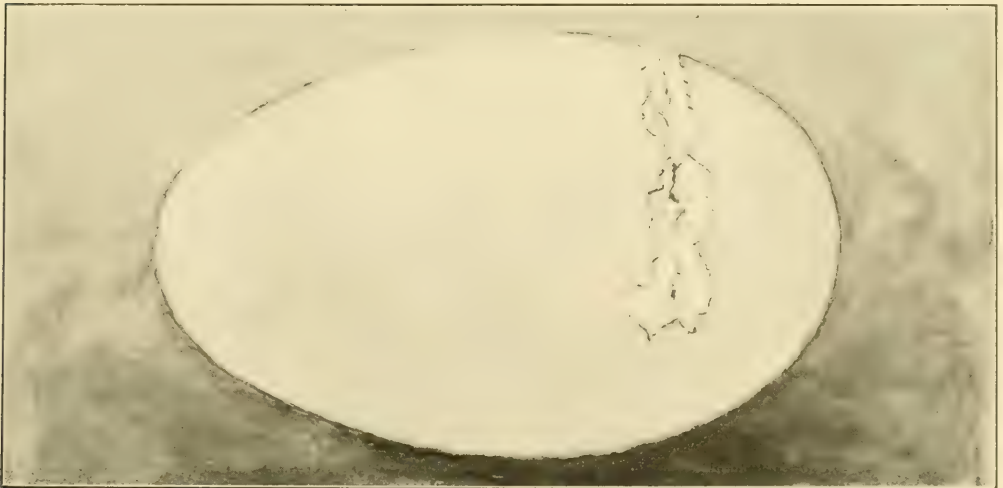
The vestry of Trinity Church, in New York City, has recently adopted measures for the protection of the birds that frequent the churchyard during migration. This action was taken at the instance of Miss Elizabeth S. Day, of Brooklyn, who reported that she had noted thirty species of birds in the churchyard, despite its location at the junction of Broadway and Wall Street, in the heart of the financial section of the city.—Henry Oldys.

The Hatching Egg.

BY W. I. BEECROFT, ADAMS, MASS.

A wonderful provision of nature impels the lower animals to do the right things at the right time, things which they could not have been taught nor have learned by previous experience; in the case of very young animals omission would prove fatal. The chick breaks its way out of the shell unaided. But it does not work aimlessly. Starting at a point where it first breaks the shell, it continues all around in the same plane by turning itself bodily as it proceeds, until by vigorous kicks and struggles it forces the lid off.

Another wonderful thing in this connection is that nature has provided a temporary means for the breaking of the shell. The chick's bill is soft, so nature has placed in the tip of the upper mandible a tiny hard scale that drops off a few days after the chick emerges as it is then of no further use.



HOW THE CHICK BREAKS THE EGGSHELL.

The Black-crowned Night Herons.

BY G. B. AFFLECK, A. B., M. P. E., SPRINGFIELD, MASSACHUSETTS.

In the Connecticut river about ten miles below Springfield, Mass., and a mile or so above Windsor Locks, Conn., is an island somewhat more than a mile

'Quack!'.. 'Quack!' as they passed up or down the river on their way to and from the marshes. Landing at a point remote from the rookery we walked without special precaution towards the nests and soon noted the whirling, circling flight of the overhead birds accompanied by their frequent, vigorous and high-pitched alarm notes. We were not only discovered but also announced as dangerous. Our nearer approach was greeted by clamor from the several hundred adult birds which after quietly leaving their nests circled excitedly overhead. Others remained perched near their nests and 'froze' among the dry bare branches of the dead hemlocks among which for the most part the nests were placed—they can scarcely be described as built as they consisted entirely of sticks loosely thrown together in a pile with slight depressions on the upper side from which at intervals the fledgling young scrambled in twos or threes or fours.

"These platforms of sticks were usually thirty or more feet from the ground and in some cases as many as four or



"OTHERS REMAINED PERCHED NEAR THEIR NESTS."

in length and about half a mile across at its widest part. Locally it is known as Terry's Island, but the Geological Survey maps indicate King's Island. On its southerly part the black-crowned night herons have nested for at least several years. The field trip of the Springfield Allen Bird Club to this heronry is thus described by one of the party:

"On approaching the island by boat we noted the slow, steady flight of the adult birds and their occasional, contented



"AND 'FROZE' AMONG THE DRY BARE BRANCHES OF THE DEAD HEMLOCKS."

five were found on a single tree. Both old and young birds would stand silent and motionless with their bills pointed upwards thereby assuming a position in



YOUNG BLACK-CROWNED NIGHT HERONS.

which they most closely resembled the dead branches among which they posed.

"A few of the young birds frightened by our approach attempted to stride away from the lower branches upon which they had been resting, but were easily captured by the more acrobatic members of the party. Upon close examination the pin-feathered fledglings presented a plumage of brown spotted or streaked with light so that while the back was decidedly brownish the under parts were gray, their legs and feet were pale green, while the glaring yellow eyes and massive mouths combined variously to give expressions sulky, threatening or stupid. Being placed upon the ground they made off as fast as they could but after a few attempts they appeared to lose some of their fear, and after food had been thrown into one cavernous, hissing mouth there was little difficulty in persuading them to swallow whatever was dropped into their gullets—sandwich, cake, or orange peel were equally acceptable. Some of these were appropriately tagged with the aluminum bands supplied by the American Bird Banding Association, and after being thus duly appreciated consented to pose for their photographs. Unshapely and to some forbidding they are intensely interesting to those who wish to make comparisons and note stages of develop-

ment. These were returned to the lower branches and though as yet unable to fly were, we trust, able to regain their nests higher up none the worse for their unique experiences.

"The trunks, branches and ground beneath the nests were bespattered with excrementa, giving a whitewashed appearance, and scattered about were feathers, fragments of dull light blue egg shells, portions of fish and occasional dead young birds which evidently had fallen from the nests or branches above.

"Desiring to know the size of the colony a count was made which placed the number of nests at approximately two hundred and fifty, while the estimate of more than a thousand birds, adult and young, seems to be conservative."

Vivid Description of the Grackle.

Will Webb Tuttle, of Muncie, Indiana, is doing good work in his community by contributing to the local paper stories and articles on nature topics. In a recent essay he speaks of the large flocks of grackles. The following paragraphs are an example of his vivid and poetical description of the birds' songs:

"They rap on the door with their four knuckles, pound the piano and hammer their snare drums as if finger movement and muscular expression are their main achievement. Saw filing, boiler making and dropping glass into barrels seem fitting figures to describe their enthusiasm as they rushed in upon us.

"The crooning of the owl and the plaintive notes of the whippoorwill possess the very soul of sunset; the song of the cardinal harmonizes with the glory of the winding river; the catbird flits to the bush and the bobolink seems like a big overgrown cricket poised in the air, the reeds in its harp filled with the splashing of rain and the skirt-rustling of ripe grain. His wing movements resemble the heat waves that rise from the parching meadow and the daisies mock his garments that are dyed by the colors of the sun."

A recent publication of the Carnegie Institution of Washington is the life history of eight species of North American frogs and toads. The author is Mr. A. H. Wright of Ithaca, New York. The account is full and the photographs are many and excellent.

The Nature Photographers

Petrified Wood.

Professor Edgar T. Wherry sends to us a photograph of logs that were ploughed up in the fields of Joseph Rich, near Woodbourne, Bucks County, Pennsylvania. He has grouped these around the base of a modern conifer that as he suggests may perhaps be a descendant of the petrified trees. Petrified wood, he says, has been found in Connecticut. Professor Hitchcock relates an incident in which a farmer found a silicified stump that looked so natural that he tried to split it.

"The tree came from the hill and we drew it down with a pair of oxen. It is nearly three feet in height and two across. The wood was plentiful on the hill, but this is much the largest specimen. Another, in front of one of the camps, came from a neighbor's (Mr. Bradley's) land. It may be a little longer, but is only half of a tree.

"When Professor Hobbs was here, he said it was the finest specimen that he had seen in these parts. He mentioned it in his book descriptive of his work



PROFESSOR WHERRY'S PHOTOGRAPH OF PETRIFIED LOGS IN PENNSYLVANIA.

The axe broke, whereupon he pounded to pieces the magnificent specimen.

At about the time when this letter was received Miss Annie L. Scofield, of Darien, Conn., visiting at ARCADIA, told us of petrified trees found in Connecticut and referred to Miss Charlotte F. Curtiss of South Britain, Conn. Miss Curtiss has kindly contributed two specimens to ARCADIA. She reports that a number of specimens have been found on the hill back of her home. To Miss Scofield, Miss Curtiss writes as follows:

along geological lines. If I remember correctly he intimates that so much silicified wood is rarely found in Connecticut as has been found on Horse Fence Hill. We have given away a large number of small specimens."

Upon writing to Professor William H. Hobbs, Director of Geological Laboratory, University of Michigan, Ann Arbor, Michigan, we received the following:

"You will find a brief description of this and other specimens of similar char-



MISS CURTISS'S PHOTOGRAPH OF PETRIFIED WOOD NEAR HER HOME IN CONNECTICUT.

acter in my Government Report entitled, 'The Newark System of the Pomperaug Valley, Connecticut,' published in 21st Annual Report of The United States

Geological Survey, Part 3, pp. 55-56, and especially in the appendix to this report by Professor F. H. Knowlton on pages 161-162."

Color of Timber Relation to Decay.

Practical users of timber have long known that there is a marked difference in the resistance of different sticks to decay, one piece rotting badly while another, under apparently like conditions remains sound. It now appears that this difference is due to varying amounts of certain antiseptics or preservatives formed in the living tree. In general, the darker the heartwood is, the more of these preservatives are present and the better the timber will last. This applies, however, only to different samples of the same sort of lumber. Different sorts of wood are naturally light or dark, so that the most antiseptic of white cedar will last three or four times as long as the much darker red. But different whites, or different reds, resist decay much in proportion to their depth of color.

A Dog Star But Not Astronomical.

From Miss S. G. Rice, Sandy Lake, Pennsylvania, we have received a beautiful photograph with a "happy thought" for a name. Dog Star as a photograph will not only attract lovers of dogs but will suggest a simple yet novel manner of posing.



THE DOG STAR.

Mirrors in Photography.

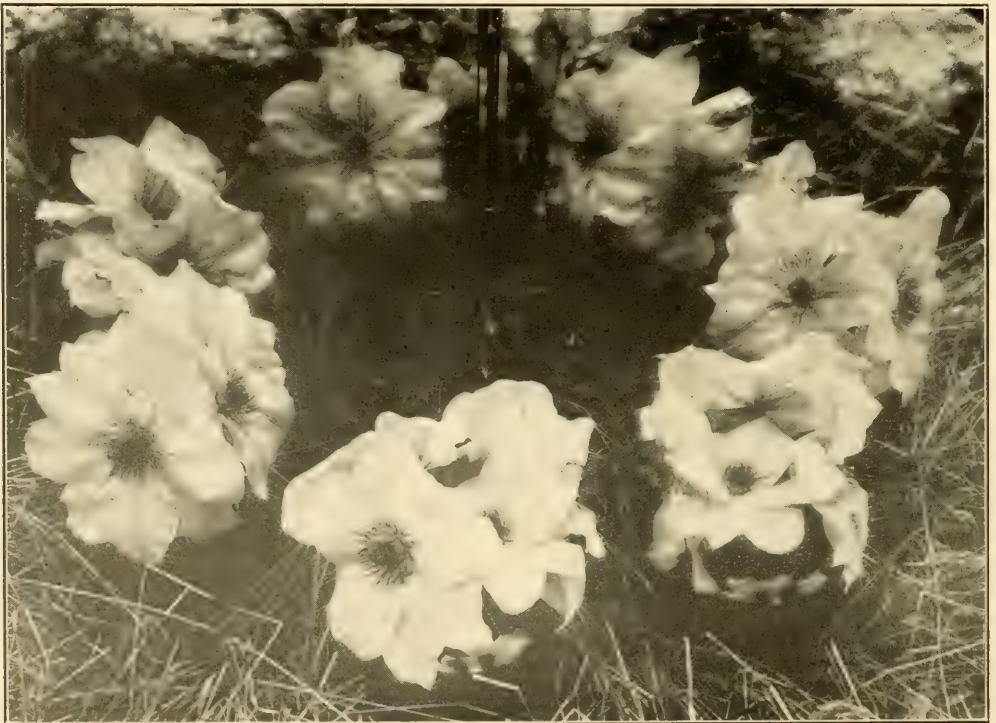
Few photographers realize the beautiful effects that may be obtained by the use of mirrors. Suitable ones that should preferably be without a frame may be obtained at small expense from dealers in plate glass, such as The Pittsburg Plate Glass Company of New York City. They may be of any size, convenient to the photographer and the space at his disposal.

One mirror may be used for photographing an object so as to show both front and back, though owing to distance the back view will be somewhat smaller than the front. Interesting duplicating effects may be made, as in the photograph of the water lilies and the white rabbits here shown. It is also desirable at times to picture some small curiosity from all points of view. This may easily be done by setting up the object in the front of the mirror and slanting the mirror sidewise, not from top to bottom, so as to reflect the farther side of the object, this reflection to be a little to one side of the object.

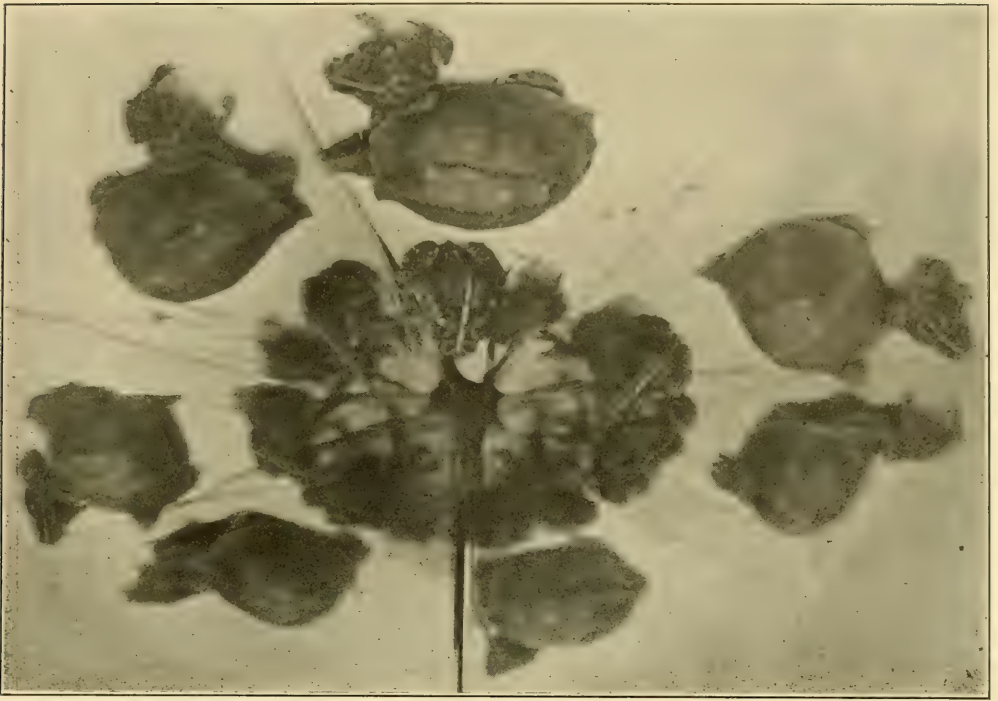
But notable and comical effects may be obtained by using two, so as to pro-

duce a kaleidoscopic effect. Take for example the little bunch of blooming clematis shown in the accompanying illustration. A wreath appears in the photograph but there is only one bunch of flowers. Astonishing effects may be had in the duplicating of animals as is shown in the photograph of the two toads, a frog and a turtle in the accompanying illustration. There are apparently seven turtles, while in reality there is only one. There is no difficulty in this kind of photography. Put the mirrors together edgewise to form a V, and photograph that V; you will have no end of interesting illustrations, according to the angle of the V. More or fewer may be obtained, according to this angle. Three or four kittens, placed within the V, will be multiplied until there are seven times as many. The writer has taken several such photographs of kittens but has never succeeded in getting all sharp and in perfect detail. The subjects were too lively.

Probably the funniest of all is made by placing within this V several toads. Put a little sticky material on the top



A BUNCH OF FLOWERS BECOMES A WREATH.



CURIOUS DUPLICATING EFFECT BY PUTTING MIRRORS TOGETHER EDGEWISE TO FORM A V.

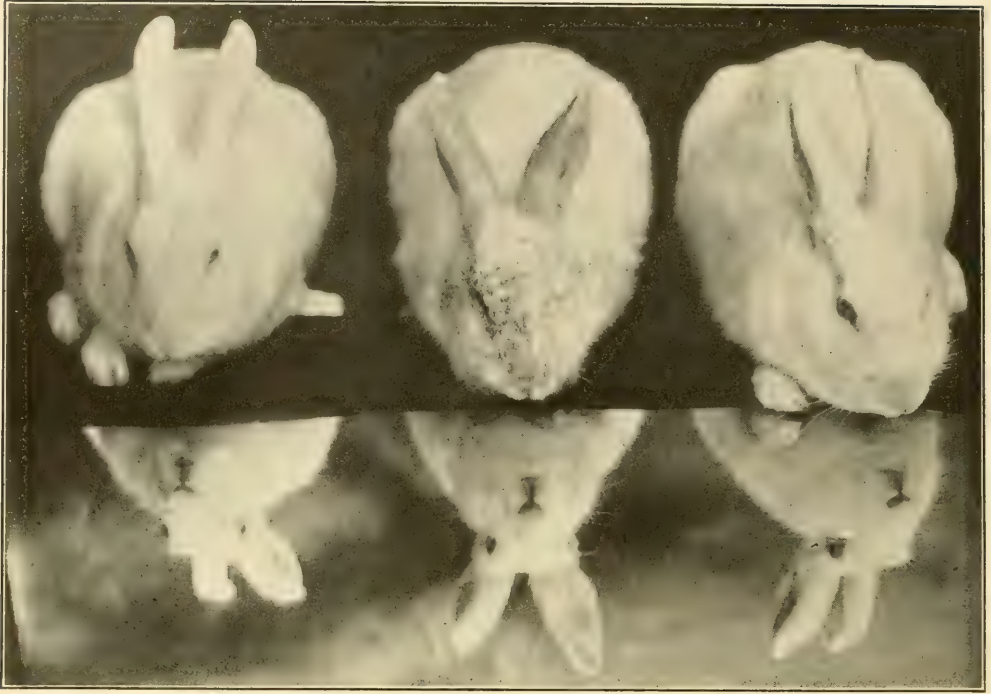
of each toad's head, and place a fly on the mucilage. It is better if the fly is alive and the glue strong enough to keep it quiet, though sometimes the experiment may be successful with a dead fly. The toad will try to catch the reflected fly. It is funny to see him slap his tongue against his own reflection. If the fly's struggles are lively, the toad will frequently repeat his tongue lapping, but will assume an ex-

pression of astonishment, evidently mystified by the failure. The toad's tongue will make curious little marks on the mirror but it is almost impossible to photograph these as the movement is so rapid that the operator cannot spring the shutter quickly enough. Other pleasing effects may be readily obtained, as in the illustration of the dancing toads.

A wooden base in which the mirror



LILIES PHOTOGRAPHED ON A HIGHLY POLISHED MAHOGANY TABLE.



WHITE BELGIAN HARES PHOTOGRAPHED ON A MIRROR.

may be set is convenient. Interesting optical illusions and really valuable studies along that line may be made by a proper placing of the mirror. A piece of plank may be easily slotted so as to hold each unframed mirror edgewise. The mirrors should extend beyond the end of the base of the stand so that they may be brought into contact.

This seems to be an undeveloped field with unlimited opportunity for many unexpected and decorative effects.

An Ideal Camp for Girls.

It is good for girls and young women to leave their homes in the crowded city and take to the woods during the summer, but where they go and under what auspices they are to spend the vacation are vastly more important. The best girls camp of which the editor has knowledge is Camp Farwell, at Wells River, Vermont. The location, environment, equipment, management are ideal. Miss Julia H. Farwell, the director, has been for many years the head teacher at The Castle, Miss Mason's School for

Girls and Young Women, at Tarrytown-on-Hudson, New York. She is thoroughly experienced in the development and management of girls and is in thorough and loving sympathy with their interests. If you would know more of this ideal camp, write to Miss Farwell, addressing her till June 1st at The Castle, Tarrytown-on-Hudson, and after that at Wells River, Vermont. She will send you an interesting and attractively illustrated book.

Sale of Books and Apparatus.

Mr. H. S. Woodman, 608 Van Buren Street, Brooklyn, New York, offers for sale his entire outfit of microscopes, slides, books, etc., at a remarkably low price. Mr. Woodman is one of the charter members of the club which became the Microscopical Section of the Brooklyn Institute. For a time he served very satisfactorily as one of the officials. On account of recent poor health he is disposing of his entire apparatus. He will mail a descriptive circular with prices to any one who will make application. This is not published as an advertisement but as a favor to a long-time, faithful worker in microscopy.

THE STARRY HEAVENS IN JUNE

By Professor Eric Doolittle of the University of Pennsylvania

THE beautiful planet, Saturn, which has been shining so brightly in the heavens for so long a time, will this month leave the evening sky. For many months this has been the only bright world to be seen in the evening heavens so that its withdrawal would have left our evening skies planet-less were it not that the bright and ever interesting little Mercury comes just at this time into its

only a short distance beyond the borders of our evening map, and it will require but a few weeks more before the steady transformation of the celestial sphere will bring this beautiful golden world, with its four bright moons, into our evening sky.

THE JUNE STARS.

The bright groups, Orion, Taurus, Gemini and Auriga, have now almost en-



Figure 1. The Heavens at 9 P. M., June 1. (If facing south hold the map upright. If facing east hold East below. If facing west hold West below. If facing north hold the map inverted.)

best position for observation of the entire year.

This swiftly moving little world will, however, pay us but a short visit: after the middle of June it will again be lost in the sun's rays, and then no bright planet will be seen among the evening constellations. But the great planet Jupiter is now

tirely disappeared, and Leo, the last of the train of winter constellations, is sinking in the west. But the two most brilliant summer stars, Arcturus and Spica, which present so interesting a contrast in color, are near the meridian in the south: the striking Scorpio, the most beautiful of all the summer groups, has completely

risen in the east, while Vega, the Eagle, and the beautiful Northern Cross have now completely entered the evening sky. As the months go by, the last constellation will swing steadily across the heavens, reaching its highest position in September and not finally sinking below the horizon in an upright position until the very close of the year.

Above Vega, the constellation Hercules is now found in excellent position for study. Above Hercules there is the beautiful Northern Crown while, still higher, the great Bootes now fills the very highest area of the heavens. At the point A, nearly in a straight line between the stars B and C, there will readily be found the wonderful cluster in Hercules, a compact mass of sixty thousand stars. This cloud of suns can even be seen as a faint, nebulous patch of light with the naked eye. In the region between the stars H. F. and Antares, there are a great many other interesting clusters (though these all require a telescope to render them visible) while at the point K there is an interesting planetary nebula, which shines as a greenish, misty, eighth magnitude star. The faint stars in the region E form the group Cerebus, the three-headed dog which Hercules holds in his hand.

THE PLANET MERCURY.

The observer should not fail during the first days of June to find this most interesting little planet, which is always so nearly lost in the sun's rays, because its

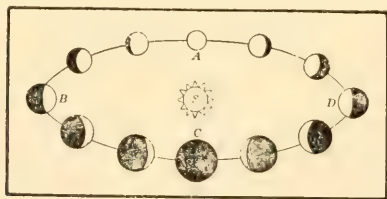


Figure 2. Appearance of the planet Mercury as it passes around the sun.

present appearance is a very unusually favorable one. The planet is now reaching its greatest distance east of the sun, and it happens that this month it recedes from the sun an unusually long distance. Figure 2 shows the shape of the path of the planet about the sun and also the telescopic appearance of Mercury when it is at various parts of its path. We always view the orbit nearly edgewise, but this orbit is not really a perfect circle, as indicated in Figure 2, but the distance from B to S is actually fifteen millions of miles greater than that from S to D. The

planet passes the point B, and is hence seen by us at its greatest distance to the left, or east of the sun, on May 31. It is because when it reaches this position the planet is at nearly its greatest distance from the sun in miles that we will see the two bodies so far apart in the sky.

The motion of Mercury among the stars during the month is shown in Figure 3. This figure shows the appearance of the western sky at 7 P. M. on June 1. On this date the planet will be seen in the northwest, almost vertically under the Twins, above and to the left of Saturn and separated from this planet by a distance equal to five times the apparent distance across the full moon. On this date Mercury will not set until two hours after sunset.

Having found the planet, the observer should have no difficulty in continuing to follow it until very nearly the middle of the month, by which time it will set only one hour after sunset. On June 1 he will see that it is exactly half full, as shown at B in Figure 2, but during the ensuing days he will see it narrowing very rapidly to a thin, silvery crescent. It will finally pass the position C. Figure 2, and enter the morning sky, on June 17.

THE PLANETS IN JUNE.

On June 1, Venus may still easily be seen in the morning sky, rising one hour and twenty-four minutes before sunrise. But this planet is both drawing nearer the sun and increasing its distance from the earth, so that it is daily coming into less favorable position for observation. It will not finally pass the sun, however, and enter the evening sky until September 12.

Mars rises two hours before sunrise on June 1, and this interval increases to two hours and thirty minutes by June 30. It is approaching the earth, and consequently growing steadily brighter, its brightness now being almost exactly that of a first magnitude star. It will not reach its most favorable position for observation until next February.

Jupiter is almost on the equator and near the Vernal Equinox. By the end of the month it may be seen rising due east so early as eleven hours, thirty minutes P. M.

Saturn enters the morning sky on June 28. It is too nearly lost in the sun's rays to be satisfactorily observed during the present month.

Uranus is in Capricornus, in the morning sky: Neptune is in Cancer and hence low in the west.

THE BEGINNING OF SUMMER.

On June 22, at seven hours, twenty-seven minutes, sixteen seconds, A. M., (Eastern Standard Time) the sun will attain its greatest distance above the celestial equator, and this will consequently be

states and forty-two minutes less in the Gulf States. On the equator the days and nights are of exactly equal lengths, while in southern latitudes, June 22 will, of course, be the shortest day and mark for them the beginning of winter.

The new comet is to attain its greatest

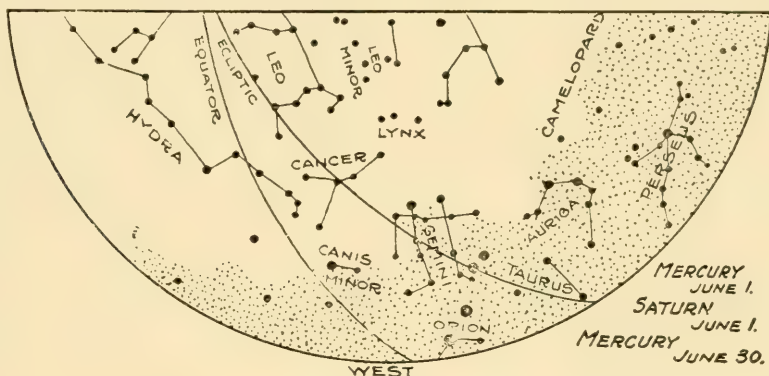


Figure 3. The western heavens at 7 P. M., June 1, showing the position of the planet Mercury.

the longest day of the year. In the latitudes of the Middle States, sunrise will occur at 4:30 A. M. and sunset at 7:30 P. M., the day thus being six hours longer than the night. This difference is sixteen minutes greater in New England

brightness during the present month and will doubtless be a very conspicuous object in the southern skies. Unfortunately, however, it is too far below the celestial equator to be visible to observers in northern latitudes on the earth.

Give Dr. Bigelow His Telescope.

[An Editorial in "The Greenwich Press,"
May 5, 1915.]

From the reading of the war in Europe whose horrors harrow the feelings of most Americans, and whose nearness to us seems to grow daily, from the struggle against unemployment and poverty at home, and from the local political wranglings following the attempt to break up machine government, the average Greenwichite will be glad to turn his mind to Arcadia.

Arcadia, the little tract of land whereon is situated the home of the Agassiz Association. There one may find another viewpoint, and there one, with the friendly aid of Dr. E. F. Bigelow, its founder, may delve into the wonders of nature and enjoy her many beauties. And in this sanctum of nature one may forget for the nonce that wars rage, that classes struggle and that human government still far misses perfection. One may see nature and glimpse in the study of the tiniest flower or animal, processes whose greatness makes all human strife seem small and puny and futile.

By continuous labor and devotion to an ideal, Dr. Bigelow has built up this little refuge. He has added department

after department in the hope of opening the vistas of nature to both young and old, in the hope of making them see, know and enjoy the world they live in.

And now he seeks to open another department—that of astronomy—the most wonderful, the grandest, the most stupendous of all sciences. He is himself an expert astronomer, and one who loves the science, loves it enough so that he can enjoy communicating his knowledge to others. And this he is willing to do if enough money can be raised to provide Arcadia with the proper instruments.

Certainly it would be a boon to give our children the privilege of wandering in the starry fields with such a guide. And there is something more than a mere knowledge of facts to be gained by such wandering. There is the opportunity to see our own world, our own struggles, our own troubles in perspective. As we sit, in the body, and gaze off into the millions of miles of ether, we can also sit, mentally, away off there in space and gaze back on this little troublesome, fretful world of ours and inspect it. We can see it and all our doings in comparison of the awesome order of the universe, its sublime calm and regularity.

We are terribly upset when we learn that a million men are being sacrificed in Europe, that mighty guns, throwing a ton of metal each, are destroying cities. We are perturbed at thousands out of employment. We are irritated at the stupidity of mortals who, through ignorance, wear the yoke of an outworn system of government.

But let us talk with Dr. Bigelow a moment. We have considered with him the miracle of growth that turns a seed into a plant and the metamorphosis of a worm into a butterfly. "How large does a star look in the telescope?" we ask. "It does not look as large as it does to the naked eye. It really has no size whatever to the telescope. It is too far away. It is merely a geometrical point of light. Light travels so quickly that it will go entirely around the earth seven times while you wink your eye, but some of the stars are so far away that it takes light five or six hundred years to travel from them to the earth. If some of them should go out of existence entirely, they would be still apparent on this earth for five or more centuries."

How small our earthly affairs appear in the light of such stupendous facts. And it is only one of thousands of facts equally amazing and equally interesting.

If a proper telescope is forthcoming there will be nightly classes in astronomy at Arcadia, to which the public will be admitted. Such a telescope as is needed will cost about a thousand dollars, Dr. Bigelow says. Some of the money has already been subscribed. He asks the people of Greenwich in the interest of popular science and their own education and enjoyment, to supply the money needed for the instrument.

It may be added that there is not at present a good observatory between Fairfield and New Rochelle.

Greenwich has been generous in all things. She has given money to help unemployed and the otherwise unfortunate. This is good on the moral side. She has given money to the church. This shows interest on the religious side. She has demonstrated her interest in clean government. This is excellent on the civic side. But she is now appealed to on the intellectual side. She is asked to provide for the purely intellectual pleasure of her children—and Dr. Bigelow does not appeal on utilitarian grounds. He says simply, now let the people, children and grown-ups enjoy themselves

intellectually.

We hope that Dr. Bigelow will have his wholly unselfish desire to serve the people intellectually, satisfied. He has done a good work for Greenwich, a work which will be better appreciated in the future than it is to-day. He has not affiliated himself with charitable movements, nor social movements or political movements. All of these things he recognizes as good, but he considers his own work for humanity a separate one.

He does not join peace parties for the ending of the European war. He is concerned with neither peace nor war. His interest is in science. One can almost think of him as of Archimedes, the great Greek mathematician of antiquity, whose interest in science made him obvious to all movements about him. Of him it is said that he did not budge at the approach of the Roman army, but continued drawing his mathematical circles on the sand. When a Roman soldier approached him and challenged him, he did not even look up but only answered: "Get out of my circle. You're spoiling my calculations." Whereupon, it is recorded, the soldier killed him, thereby destroying his body but not his fame nor his great work.

To those in Greenwich who have money we say: "Give Dr. Bigelow his telescope. He can do more than a thousand dollars' worth of good with it. He can't rehabilitate families with it nor mend broken bones nor launch political campaigns, nor feed hungry stomachs, but he can feed hungry minds, and we must always remember that 'man lives not by bread alone.'"

Bulletin of Scientific Supplies.

Mr. Edward Pennock of 3609 Woodland Avenue, Philadelphia, is issuing a "Special Bulletin" of his scientific instruments and supplies that will be of interest to many of our readers. A free copy will be mailed upon request. Kindly refer to *THE GUIDE TO NATURE*.

Summer School of Biology.

We take pleasure in calling attention to the Summer School of the Biological Laboratory at Cold Spring Harbor, Long Island. The regular class work will begin June 30th and continue for six weeks to August 10th. A circular with full particulars may be obtained by addressing Dr. Charles B. Davenport, Cold Spring Harbor, Long Island, New York.

Neerology

Death of Thomas Edwards.

Thomas Edwards of Rye, New York, for many years a Sustaining Member of The Agassiz Association, died on Wednesday, May 5th, at the Greenwich Hospital following an operation performed a little more than a week previously. Mr. Edwards was born October 20th, 1843. He was a farmer, carpenter and veteran of the Civil War. Always a lover of outdoor life he was in the broadest and best sense of the term an ideal member of the AA. While not in any sense a technical scientist, his love of the country and the seashore was heartfelt. His mentality was great, and as a lover of music and the fine arts he excelled. His disposition was quiet. He disliked notoriety, and his reluctance to attract attention always kept him in the background. In his hotel work he was famed for his management of everything that tended to increase the enjoyment of the seashore, but when he had large parties to serve he usually kept out of sight, preferring to oversee the affair from within, rather than to mingle with the visitors. He disliked ostentation of all kinds, and loved a life of inward contemplation, appreciation of educational uplift, and of commonplace nature with uncommon interest, that made him one of the most valued members of the AA.

A Camping and Sight-seeing Tour of the West.

Our readers were interested in Professor J. Chester Bradley's advertisement in the last number of THE GUIDE TO NATURE, repeated in this, offering to take several boys on a sight-seeing tour through the Canadian Rockies, Yellowstone Park, Yosemite Valley, and other places. Interesting phases of nature will form an important part of the sight-seeing. The editor of THE GUIDE TO NATURE has been acquainted with Professor Bradley for many years and knows him to be thoroughly trustworthy. He has had much experience with students, is thoroughly competent to take charge of such a tour. He says:

"I believe that nothing is so conducive to pleasure in travel, and in life in general, as an interest in nature, and in the phenomena of the world around us. Such a trip as we are about to undertake is a great object lesson. It is geography and

geology, as well as history and human activities lived instead of studied from a text-book. I shall consider myself to blame if any boy of our party fails to find such an interest in all that we see, whether desert or mountains, whether birds or butterflies, whether flowers or trees, and in the 'how' and 'why' of them all."

We urge every reader of this magazine to send to Professor Bradley, Cornell University, Ithaca, New York, for further particulars.

Spring Mushrooms.

Schenectady, N. Y.

To the Editor:

During May and June, in the latitude of New York and Boston, there is found in the woods, especially after warm rains, an edible fungus popularly known as the morel or spring mushroom.

The botanical names for the three principal species are the *Morchella deliciosa*, *M. esculenta* and *M. conica*. These closely resemble one another in that the hollow top is a light gray or buff yellow, pitted so as to look somewhat like a sponge, and supported on a white or whitish hollow stem. Their height usually varies from three inches to six inches and the diameter of top from three-quarters of an inch to one and one-half inches.

Owing to their peculiar appearance, and the fact that they do not in any way resemble the more common mushrooms with an umbrella-shaped cap on top, it is rather difficult to describe them in words; and as a result of their peculiar and distinctive characteristics, an inexperienced person seeing one for the first time would probably not consider it a mushroom. However, an examination of one or the study of a good picture, such as is shown in Bulletin No. 85 of the U. S. Department of Agriculture, will serve to familiarize any person with this interesting plant.

Owing to the ease with which they are identified, and the fact that all species of this genus are said to be edible, various authors highly recommend them for amateur mushroom hunters to begin with. They are also credited as being one of the finest of our mushrooms.

B. D. MILLER.

Here is a good suggestion. Will our nature photographers please obtain some good photographs of this peculiar mushroom?

The RUNNING at SWARMING TIME



(C)

Fun, Fancy and Fact.

The experiences that I am about to relate were not uncommon, and were not rarely repeated, on many a warm day in the latter part of May or of June, from thirty-five to forty years or more ago, and at about ten o'clock in the morning. (Perhaps also in some parts of the country at the present time).

It was swarming time. Memory may be playing a trick, but most of these oc-

blissful change in his monotonous life? To him it meant another Fourth of July pandemonium. Never mind if more hay was dried and drying than could possibly be gathered on that day; no matter if thunderheads were looming ominously above the western woods; never mind if nearly every hive was well filled and we already had more bees than we knew what to do with, drop everything and respond to that far-reaching cry, "*The bees are swarming!*"

Father was the first and foremost in leading the running at swarming time, but each of the other workers came in for the close second, knowing by the promptness with which he dropped the pitchfork and leaped across the field that the conditions were serious. So sudden a movement of course alarmed the oxen and they started to run. John yelled, "Whoa," and even I hesitated in my rapid transit toward the house, but Father shouted, "Let them go; they will run only to the farther edge of the barn lot, and will be all right there in the shade." I arrived just in time to see the



(C)

"THE BEES ARE SWARMING!"

currences have taken place in the barn lot hayfield. While some of the men were loading the hay that had been dried and stacked on the previous afternoon, others were mowing in another part of the field. The oxen and the wagon were near one of the largest haycocks and the wagon was about half loaded.

Suddenly, unexpected, startling, came a shrill cry from the farmhouse, "*The bees are swarming!*" When did a farmer boy ever hear that high-pitched warning or those magic words, without having his heart leap in anticipation of the joy of the coming contest, and the



(C)

"THE ENTIRE ATMOSPHERE SEEMED FULL OF FLYING PILLOWS."

octogenarian Grandmother enter the race. Upstairs she hurried to the spare bedroom—never entered except on rare occasions when some distinguished guest was present or expected. She pulled the bedclothes off. She thought that she piled the pillows in a chair, but in her excitement she seemed to be having a pillow fight. She threw those pillows right and left. There probably were only two on that bed, but the entire atmosphere seemed full of flying pillows. She threw down comfortable and blanket; she pulled out the sheet, because, as she

was with great difficulty that he could walk from the house out to that chair, suddenly joined in the general scramble. Forgetting his stiff joints, and even one of his canes, he ran for the very last empty hive—one hardly fit to use, but in the emergency anything and everything must be brought into service if the swarm was to be saved, even if the hay were lost. With the hive he ran to the workshop because the cover was a little loose and one side was a little uncertain, and like the expert carpenter that he was, he hurriedly drove in the necessary



"THE CONCOCTION FROM THE PANTRY."

explained, all the others were in the wash just when she most needed them. She gathered up the sheet—no, gathered is not the word—she did not fold it, she did not crumple it, she just "wapsed" it up and pushed it under one arm, leaving the other hand free to cling to the railing as she hurried down. I had followed her, not expecting to be of much assistance, but rather to see the good old lady struggle with the bedding.

In the meantime Grandfather, who spent a decade or more punching his cane into the ground by his easy chair under the apple trees, and who said it

nails, one, as I recall it, a shingle nail, the other a spike. Anything that would hold the parts together would do. All this time Grandmother had been engaged on a second round of running. From the pantry she grabbed a hand basin, vinegar, salt, sugar, pepper, molasses—perhaps I may be slightly in error in regard to the pepper; possibly the salt is a little off, but again treacherous memory brings to me a vision of a frantic grabbing of anything and everything from the shelves, high and low. And then out she dashed through the kitchen to that bench. The whole thing was

well timed. She and Grandfather had done their best; I was the only negligent spectator, remiss in running duties at swarming time. "Boy, why don't you run? Run, hurry up, get some walnut leaves." I needed no second command. I darted by the woodhouse, over the stone wall into the cow pasture. Hurdledly I clambered to the top rail of the fence under the branches of the walnut tree. Just as I was reaching my best and pulling down and cutting a bunch, one of the stakes in the fence dropped and down I went, hands full of branches and jackknife, rails flying in every direction, but somehow in the melee I closed the jackknife, grabbed the branches, rubbed off the greater part of the mud, and started on my homeward run. But I could not arrive soon enough to escape the storm of reprimands that I knew was sure to follow if I kept them waiting. *The concoction from the pantry must be made, for, you know, the hive must be scrubbed with the walnut leaves, with the mixture of vinegar,*

water, salt, sugar, molasses. I know not what mysterious things went into that scouring preparation. Possibly there was a dash of vanilla flavor. There must have been for there seemed to be a dash of everything else in every direction. Again there came a shout, "Run, why don't you run?" In his frantic efforts, John, the hired man, tore the garden gate from its hinges, and made a wake in the truck and the corn, such as a swift yacht makes in the waves. His destination was the rail fence. I could have told him, if he had asked me, where he could find plenty of rails spread in delicious and extravagant profusion, for had I not been there? But he heeded me not, nor even thought to profit by my experience. He wanted a rail, and he wrecked the best part of a fence to get it.

Father also, courageous man, ran through the garden, for he, like a brave general, had reconnoitered the field and prepared his plans for the battle. He seemed calmer than the rest, as befitted the high dignity of his position as general in that saltatory army. Although the bean poles had been set in the garden and the beans had already begun to climb around them, what of that? What if he pulled off a few of the tendrils? Beans can grow more tendrils and the poles may sometimes be returned to their places. At any rate he stopped not to reason why, his but to do or die; he took a pole in haste, and with it most of the beans. Back through the gate he went, closely followed by John with the rail on his shoulder.

In the meantime Grandfather had brought the hive and Grandmother the sheet. Again I heard that shrill voice, "Run, boy, run!" I was to get out of the stone wall four cobbles, smooth and round, "about as big as your two fists." The sheet, in our frantic endeavors, was almost torn in two, and I pulled so hard that I almost pulled the fatigued and trembling old lady off her legs, and worse than this, I started a rip in the middle seam of the sheet. The sheet at such times must be spread smooth, and to make a sheet smooth you must pull it, but no law in the land has ever said just how much you may pull, and yet escape the horrible calamity of pulling it in two. When it had been snapped and smoothed and laid firmly on the ground, a cobblestone was placed on each of the corners,



"HE TOOK A POLE IN HASTE, AND WITH IT MOST OF THE BEANS."

Then the hive, under the skilled supervision of the general, must be placed just right. It was his practiced eye that decided how far the top should be inclined backward, and when it should be held by the rail, and where one end of the rail should touch the hive and the other be braced against the ground. It was a delicate and complex proceeding.

The time had come for Father to shoulder the bean pole, and to march as with a rifle to meet the enemy. Should I leave him alone in a situation so perilous? Not I. I dashed through the kitchen into that sacred spare room, and grabbed my double-barrelled, muzzle-loading shotgun. Hastily I pulled out the ramrod, took off the cap of the wormer, thrust the rod down one barrel after the other, and pulled out the hornet paper wadding. I inverted the gun and poured into my palm two charges of shot. It was only the powder that was wanted. We had no desire to kill anybody or anything. Our only object was to make a noise and I was willing to make my share or more. Back I ran to the apple tree under which was the center of all interest, in time to see the completion of the hive adjustments, and Grandfather panting for breath, and exemplifying a mixture of all sorts of gaits in his effort to reach the wood shed, not the workshop portion, but the open space portion where was the wood pile and where was the ladder up which the chickens went to roost in the attic. Just under that ladder was a wooden peg on which hung the old string of sleigh bells, never to be used except at swarming time. I can even now hear their crisp, metallic music, as their vibrations rang in sympathy with the old man's jumping. "Run, run; why don't you run?" With a crash of clanging metal he arrived, and met Grandmother, who had been back to the pantry, where she had snatched a polished tin nail in one hand, and a shining tin pan in the other. She thought that she might work double-action in flashing the light into the swarm, if perchance it should decide not to accept its new and well scrubbed home.

Philip, a boy about my own age, who lived on an adjoining farm, grabbed a pail and ran to the middle of the road where was a liberal supply of dry sand. He went on that errand with a swiftness so frantic that, it seemed to me, he could

never be equalled by any other boy, and though the pail was nearly full, he rushed back as if the content were as light as feathers.

Susie ran to the sitting room, grabbed



"SUSIE REACHED UP TO TAKE AN OLD-FASHIONED LOOKING-GLASS FROM ITS NAIL NEAR THE CEILING."

a chair, climbed on it and reached up to take an old-fashioned looking-glass from its nail near the ceiling. In her haste she lost her balance, the chair tipped over, but by some miraculous intervention, perhaps the great necessity of the bees at that time, she escaped with a few bruises, and the mirror without even a crack. Even Bill, who under ordinary circumstances could not be prevailed upon to mow the grass within several rods of the hives, and who seldom knew that there was such a thing as a well on the place because of his familiarity with the cider barrels in the cellar, now suddenly became brave and an ardent advocate of cold water. He seized one of the inverted milk pails that were hanging in the sun for purification and drying; he dashed the bucket down the well and pulled it up as if he was thoroughly familiar with cold water and poured the contents into that milk pail. Then hurriedly grabbing a dipper, he hastened to the scene of action.

Everybody was in readiness and there came over the scene a hush like that which precedes a thunderstorm. The central figure was my Father. All eyes and hearts instinctively turned to him as to one upon whom everything depended. He shouldered the bean pole and

marched bravely forward. Oh, could there have been present some rustic poet to sing, bees to the right of him, bees to the left of him, bees in front of him—and so soon, so soon, bees to be behind him. He brought that bean pole back over his shoulder, firmly grasped in both



"WITH ONE TREMENDOUS BLOW HE STRUCK THAT LIMB, BREAKING THE BEAN POLE IN TWO."

hands, made careful estimate with his skilled eye of the relative distance between sheet and hive and hanging cluster on the apple tree limb so heavily suspended. Possibly the long pause and the feints of striking at the limb were all needed to take sure, steady and effective aim. But as I look back upon it now after all those years, I am inclined to think he was like some public men whom I have known and who enjoy being the center of attraction and are the willing recipient of laudation for bravery, although he was, as we have known other public men, soon to be in ignominious flight.

With one tremendous blow he struck that limb, breaking the bean pole in two, because white birch poles, although apparently strong, are in reality only whited sepulchres of deception. Down came the black mass in a solid lump, but, as if it had exploded when it touched the white sheet and dashed against the slanting side of the hive, its constituent particles of pungent possibility, scattered in a humming cloud of wrath toward every point of the compass. Then came a unanimous and synchronous signal to run. No individual now ran for any specific purpose, but everyone, old and

young, lithe and limber, or with creaking joints, ran in one ignominious skedaddle. Grandfather seemed to have acquired magical agility and no longer needed a cane. Grandmother renewed her youth and leaped on those slender ankles as if she was only "sweet sixteen." There comes a vision of the bare feet of Philip, of Susie, and of Julia and even of tiny "tow-head," who lived in a nearby tenement house, as they disappeared suddenly through the gate or over the stone wall around the corner of the house. Here was a case in which the slowest was the bravest, and the rear more dangerous than the van. In the rear I stayed, not so much from innate courage, but from eagerness to fire the gun of which I was fond. Whether the bees were going off or not, we delighted in construing their hovering in the air as susceptible of that interpretation.

Though he had not read books and though he had never opened a hive containing live bees, Grandfather was presumed, as the outcome of long years of observation and especially of punching his cane into the ground, to have an acquired knowledge of bees superior to that of ordinary mortals. All eyes were turned toward him. How delightedly we heard his decision, "The bees are going off, we must stop them." Joy of

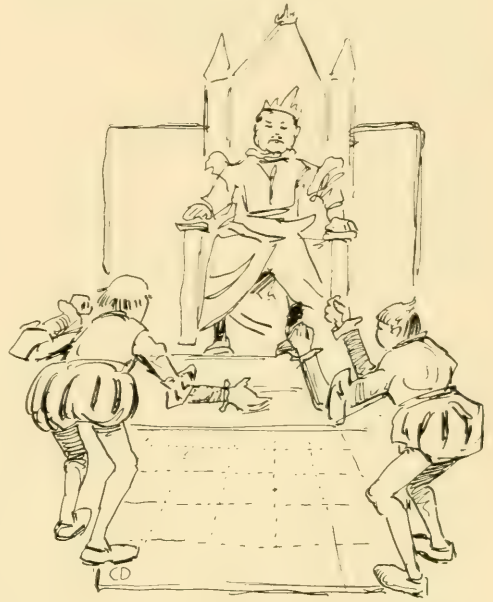


"I . . . ADDED MY QUOTA OF NOISE TO THE DIN."

joys. When did farmer boy or farmer girl ever hear more delightedly the summons to break forth into Fourth of July pandemonium, aye, even demoniacal racket. I loaded and fired as fast as I could and added my quota of noise to the din of jingling sleigh bells and the rattling of tin pans. I stood my ground. I would not retreat so long as there was any powder left. What though I be sprinkled with sand, drenched with water, and have the sunlight flashed in my eyes from glistening tin pans and heirloom mirrors? Only one other kind of excitement do I recall as being anywhere near as deliriously delightful as the hiving of swarming bees. That was when occasionally the roof got on fire around the chimney. If it had not been for those occasional attic fires and the swarming of the bees, the country boy's pleasures in life would have been far fewer. He would have had to content himself with such quiet affairs as the frog pond, with, at long intervals, the excitement of breaking in a pair of steers or a colt. It is true that sometimes it did seem as if all these frantic endeavors were wasted, because the bees had a way of going high in air, perhaps returning to a branch of the same tree, or possibly alighting upon a little maple only a few rods away. That maple seemed to be a favorite position from which to reconnoiter the field.

But perhaps the reader who has not had these delightful experiences, perhaps the pathetic reminiscences of the long ago, will ask why all this. Let it be explained that for centuries bee-keepers have accepted the theory, or shall I say the myth, that swarming bees must be thrown into confusion, it makes but little difference how. Any one of a multiplicity of methods was regarded as effective—water, sand, light, noise, anything and everything out of the usual order of things was regarded as destructive of the discipline supposed to exist, and by which the queen, sometimes mistakenly called the king, led forth her myriads of followers in flight. At the present time there is a lingering belief in the minds of even skilled bee-keepers, that such confusion in mid-air has an effect similar to that of puffing smoke into the hive. Smoke does not stupefy. It makes the bees think of something else and turns their attention away from stinging, while this confusion in mid-air makes them think of anything and every-

thing except getting away, and I should not wonder at that. I do not see how, amidst the showers of sand and the dipperfuls of water, any bees, especially those that were struck by the flying solids and liquids, could have gone away. On the contrary, they brought dead bees to the ground. But what if out of some ninety or one hundred thousand a few thousand were killed? One must expect that any great war will have some vic-



"HE KNOWS THEY CAME FROM MY SKEPS."

times. Not all can reach the promised land of vinegar-washed hives.

There are those who say that this time-honored custom originated with good King Alfred, and that it was done in obedience to man's law, and not to the biological or innate characteristics of the bee. At any rate, after all these years, King Alfred cannot dispute any charges that may be laid on his royal shoulders. So let us throw it all on him, and insist that our country people have for centuries been unwittingly perpetuating a royal edict.

This is the tradition. Once upon a time, never mind the year, but we naturally infer that it was in the beautiful month of May, an excited bee-keeper rushed into the royal presence shouting, "He lies, he lies. They are not David's bees; they are mine. He knows they came from my skeps. I know my bees when I see them, and they went straight from my apiary down across the meadow

to the tree, and there I claimed them as my own and was going to gather them in, when that thief would take them from me."

David without waiting for him to finish this long speech had been shouting excitedly, "He's a liar, he's a liar, he's a thief. He knows they came from my skeps. He is trying to get away my property."

Meantime the calm, philosophic King was the very personification of patience, benignity and placid intelligence. As David and Jonathan became almost exhausted by their frantic argumentative efforts, the good king raised his hand and held it above his head, as a signal for the agitated disputants to cease their clamor. Silence reigned in that austere court room. One could almost hear the sands dropping through the hour-glass and not a word broke the ominous silence. The well-adjusted cell structure of that great brain was formulating an impartial judgment. Either David or Jonathan, no one but that kingly brain could know which, should go home with full title to that colony of bees, while the other would be ridiculed and reviled as he passed along the street, because, "He tried to steal his neighbor's bees."

So the silence seemed to imply, but in fact the royal wisdom was not only puzzled but completely dumfounded. There seemed to be no facts in the case upon which to base judgment. Solomon with the baby and two clamoring mothers had an easy job in comparison with this. At last the silence was broken. The king decided that in so evenly a contested matter, it seemed but right that each should take one-half of the colony. But tradition saith not who should take the queen, but of what importance is one queen when the wisdom of a king is in jeopardy? Is this the only time that a judge's decision has set individual rights at naught? Then, as an amendment, he said to the clerk who was ready with quill pen and sand box, "You may, sir, put it on record that hereafter when a bee-keeper has an absconding swarm he shall immediately, upon his first knowledge of such absconding tendency, forthwith take the dinner bell or the fish horn, whichever in his own judgment shall be the most convenient, and proceed by vigorous clanging or stentorian tooting to proclaim his ownership. Then upon the whole village having been notified by the first clang or official toot,

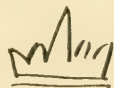
it will be readily seen by all the bystanders and fellow neighbors that any secondary clangings or intruding toots shall become ridiculous in the sight and hearing of the aforesaid neighbors and shall thereby make it perfectly clear who is the real owner of the colony. Thus not necessitating the laborious workings of a kingly brain which, on these hot, May and June days, is more fittingly to be indulging in peaceful slumber under the shade of the widespreading beech tree. Here endeth the edict."

But time passed on and the loyal subjects of good King Alfred, like the old king himself, were laid to rest, and the daisies bloomed above them, and their bees were forgotten, and forgotten by their successors was the original purpose of the edict. They remembered only the clanging and the tooting and the consequent pandemonium. David and Jonathan and King Alfred have been the cause of more delirious, hilarious fun for country boys and country girls than ever they could in their wildest imaginings have dreamed of. But there is one farmer boy whose memory runs back to the comedy and the pathos involved in the running at swarming time, and he now exclaims, "Decades have gone by, participants of that old homestead have, like King Alfred and his disputing subjects, laid aside kingly powers, clanging bells, tooting fish horns, flashing mirrors and noisy guns, leaving only peaceful, pathetic memories of the running at swarming time."

Somewhere I have read that a traveler in England saw a soldier walking slowly back and forth on guard in the middle of a field. The curious American went to the commandant and inquired why a soldier was so uselessly on guard in such a place. The reply was that it was in accord with the time-honored custom, that his predecessor in office had always kept an officer on guard in that place and that his predecessor had done so. Then why should he be so presumptuous as to violate the authority of precedent? Our American visitor after further investigating the matter by looking up the records of that place found that a few centuries ago the queen and her attendants were walking in that particular spot and there found a beautiful flower. That it might surely come into its fullness of beauty the queen requested that a guard be placed by the flower. Later on when the flower was fully ex-



EDICT



Hereafter when a bee-keeper has an absconding swarm he shall immediately, upon his first knowledge of such absconding tendency forthwith take the dinner bell or the fish horn, whichever in his own judgment shall be the most convenient and proceed by vigorous clanging or stentorian tooting to proclaim his ownership. Then upon the whole village having been notified by the first clang or official toot it will be readily seen by all the bystanders and fellow neighbors that any secondary clangings or intruding toots shall become ridiculous in the sight and hearing of the aforesaid neighbors and shall thereby make it perfectly plain who is the real owner of the colony. Their not necessitating the laborious workings of a highly brain which on these hot May and June days is more fittingly to be indulging in peaceful slumber under the shade of the wide-spreading beech tree.

Here endeth the edict



King
KING

CD

"HE SAID TO THE CLERK WHO WAS READY WITH QUILL PEN AND SAND BOX."

panded, she walked again in the fields and picked it in its gorgeous fruition, but she forgot to countermand the order to the guard. And so who would presume to go against the queen's authority? The soldier went on guarding and his successor went on guarding until when several decades had passed everybody had forgotten why there was a guard in that particular spot.

So I think it was with King Alfred and Jonathan and all the loyal villagers in the edict of the noise at swarming time, his successors have forgotten the

reasons why it was to make an infernal noise in the sky.

But do not laugh too much at those good old people. Perhaps there was something more than a legal right involved in the matter and, like the proverbial great smoke that implies at least some little fire, in all those noisy demonstrations there may be a little fire of reason. At any rate, could I bring back old Dutch Willie, or Villie as most people called him in imitation of his own peculiar pronunciation of his name, he would prove a valuable witness in favor

of the efficacy of yelling and of throwing sand. I recall that once in spite of all the noisy demonstrations the bees persisted in going to more quiet fields. The bees arose, a cloudy mass, high in the air. They circled like a swaying balloon anchored by its rope, until they had obtained their bearings and across the field they flew, straight for the woods beyond.

from Villie. Who shall say whether it was the result of Villie's screaming and jumping-jack performances, or whether they unsolicited would have alighted there? In any case it is beyond my philosophy to tell whether here was a case of cause and effect or only a funny coincidence. Villie claimed the honor that evening and he told the men



"I CLOSE MY EYES AND SEE THAT EXCITED DUTCHMAN PRANCING IN THE MIDST OF THAT SWARM OF BEES."

Directly in their line of flight was ridiculous old Dutch Villie smoking his pipe and hoeing corn on the summit of the hill, lost in placid memories of his fatherland and in longings for the beer of his adopted country, or thinking of his next attempt at drinking some three dozen mugs of that beer on the Saturday's half holiday in the near-by village. The bees literally took a bee line. It led them high in air over the valley, but close to the ground on the summit of the hill around Dutch Villie. The most astonished Dutchman that ever existed was in that cornfield, when ninety thousand bees swarmed near him in their slow flight onward. Bees in swarming fly swiftly around and around and around like the balloons of the solar system, while the entire family moves slowly onward. Villie was in the very center of that flight and he had a little dirt throwing and a pandemonium of yelling all to himself. He used hands, arms, legs and mouth—a veritable jumping-jack, to my great delight, as I ran up the hill to ascertain where those bees were going. But the thing worked, or seemed to work, for the bees settled on a scrub of a wild cherry bush not far

at the tavern that he had saved a swarm of bees that was worth five dollars, because he yelled and threw dirt at them. I am not sure of the validity of his claim, but I do know that he gave me more than five dollars' worth of fun that day, and many a laugh since then, as I close my eyes and see that excited Dutchman prancing in the midst of that swarm of bees.

A Peculiar Cloud-Effect.

'Twas eventide. The small lad stood on the bridge clapping his hands vigorously. Beyond the brow of the hill a dull red glow suffused the sky.

"Ah, little boy," remarked the stranger, who was a little near-sighted, "it does my heart good to see that you appreciate yon cloud-effect."

"Yes, sir," replied the lad. "I've been watching it for ten minutes."

Upon the boy's face there appeared a smile of perfect bliss.

"A real poet without a doubt. And do you watch the sunset often, little boy?" asked the stranger.

"Sunset? Why, that ain't a sunset, gov'nor; that's our schoolhouse burning down."—Exchange.



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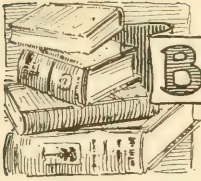
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This is an English book written with both genuine amateur and professional spirit. Its numerous illustrations are out of the ordinary, and convey new ideas, especially in the mounting and arrangement of specimens for the herbarium.

BILL'S SCHOOL AND MINE. By William Sudards Franklin. South Bethlehem, Pennsylvania: Franklin, Macnutt and Charles.

An interesting collection of essays to which the keynote is the author's statement in his preface, that "some things in this world are to be understood by sympathy, and some things are to be understood by serious and painful effort."

NATURE NOTES FOR OCEAN VOYAGERS. By Captain Alfred Carpenter, R. N., D. S. O., and Captain D. Wilson-Barker, R. N. R. Philadelphia, Pennsylvania: J. B. Lippincott Company.

This book presents a comprehensive survey of the life, conditions and phenomena in the great ocean depths. An amusing anecdote is worth printing:

"Æsthetic Passenger (to old salt): 'Can you tell me, my good man, the name of that fine bird hovering about?'"

"Old Salt: 'That's a halbatros, sir.'"

"Æ. P.: 'Dear me! Quite a *rara avis*, is it not?'"

"Old Salt: 'Dunno, sir, I've always heard it called a halbatross.'"

Æ. P.: 'Yes, yes, my good fellow, but I call that a *rara avis*, just as I call you a *Genus homo*.'

"Old Salt (indignantly): 'Oh, do you? Then I calls that a halbatross, just the same as I calls you an old humbug.'"

SEEHEARWRITE. Guide to taking notes in Nature Study for "Hunters of the Beautiful." By D. S. Hartline, A. M., Head of Department of Biology, State Normal School, Bloomsburg, Pennsylvania. Bloomsburg, Pennsylvania: George E. Elwell & Son.

This is a novel form of notebook. It is unlike anything else that the reviewer has ever seen. It consists of a pocket, doubled somewhat like that commonly used by clerks in a store, and contains a large number of appropriate quotations, many of them of a religious nature. The principal quotation is, "Be ye lift up, ye everlasting doors: And the King of Glory shall come in." This is in ornamental type within an appropriate emblematic design. The whole thing is so unique that we suggest that our readers write

to Professor Hartline for descriptive circulars and particulars.

One of the novel suggestions is,

"Bring a nice lot of (a) Wotisits,
(b) Wantunos."

THE POCKET NATURE LIBRARY. Tree Guide (Trees East of the Rockies) by Julia Ellen Rogers. Flower Guide (Wild Flowers East of the Rockies), Bird Guide (Water Birds, Game Birds and Birds of Prey East of the Rockies) and Bird Guide Part 2 (Land Birds East of the Rockies) by Chester A. Reed. 700 Color Plates, 1,000 Text Pages. Bound in Leather. Price, \$4.50. Garden City, New York: Doubleday, Page & Co.

These four books are convenient, attractive and efficient. What more can be said? When one goes afield if several books are taken in addition to the necessary apparatus they become literally impedimenta, but with these special books one can carry a library covering the flowers, the trees and the birds. It probably will not be necessary to take more than one book on birds since one volume is devoted to land birds and the other to water. It is a delight to sit under a tree, consult a little book and compare the color plates with the living bird and thus identify and fix it in mind.

Miss Rogers has produced one of our best books on trees and her simplification into this pocket volume should elicit the gratitude of every lover of trees.

STAR LORE OF ALL AGES. By William Tyler Olcott. New York City: G. P. Putnam's Sons.

Many of our amateur astronomers will find this book especially delightful. We not only like to know the names of the stars and something of celestial mechanics but also want to know the beautiful myths and legends that time and fancy have woven about them. People who admire the beauty of the stars may learn to love them by reason of the literary and legendary association recalled by their appearance.

The author, as "Who's Who in America" tells us, is a lawyer, but it is evident that he is also an enthusiastic amateur astronomer, since he has written several important and interesting books on the subject. A further aim has been to revive an interest in the mythology that twines about the stars. It has seemed but right that this wealth of star lore, buried in the treasury of the past, should be brought to the light, to charm and interest those who scan the skies. The same author has issued another volume entitled "Sun Lore of All Ages." This is devoted to mythology, folk lore, sun worship, emblematic and symbolic forms of the sun and to the sun as revealed by science. Both books are valuable. They cover the entire field in a masterly manner.

The Guide To Nature

To Know The Starry Heavens

(SEE PAGE 55)

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Vol VIII
No. 2

July 1915

EDWARD F. BIGELOW
MANAGING EDITOR

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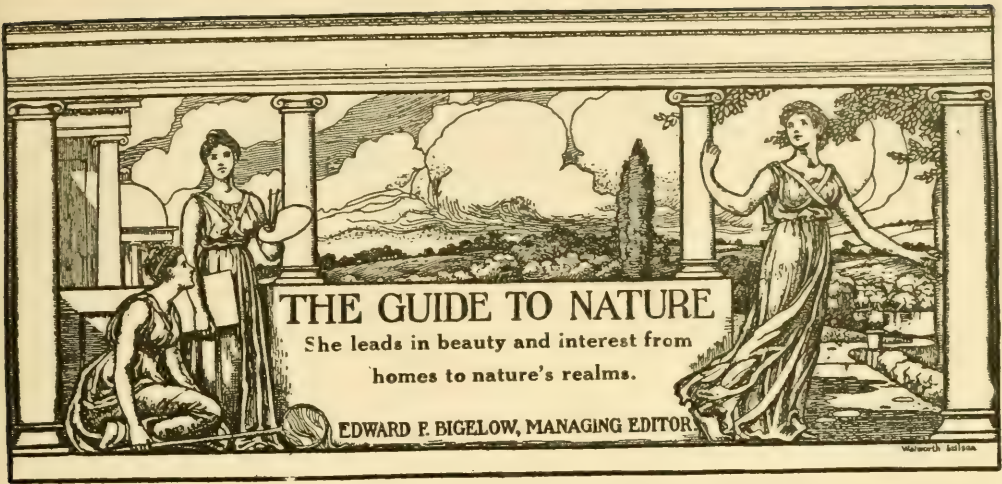
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Volume VIII

JULY.

Number 2

A Thoroughly Commendable Vagabond

BY EDWARD F. BIGELOW, ArcADIA, Sound Beach, Conn.

CURIOS, is it not, how some words are a sort of slur upon the human mind? They are pessimistic in result although in themselves they may be only good. Take the word prejudice; it really means a prejudgment, yet it conveys the impression that the mind is thinking disparaging things. What is a vagabond? One that exemplifies the meaning of the Latin word "vagus," to wander around. It is a curious fact that the mind usually thinks of a wanderer as necessarily bad. Should not one suppose that the language would commend a vagabond as the very opposite of a stolid loafer who has not life enough to move from the position where he sits and thinks and sometimes only sits?

Bliss Carman of New Canaan, Connecticut, has for many years been teaching and inspiring mankind with the idea that one may wander around, yes, even be a highly commendable vagabond and think thoughts that are uplifting, even heavenly. His poem, "The Joys of the Road," in "Songs from Vagabondia," gave me my first knowledge of this delightful vagabond. At that time I had become imbued with the spirit of Walt

Whitman's "Afoot and light-hearted, I take to the open road."

One thinks of Whitman as swinging along at a rapid pace in a rough and ready style, but when we turn to Bliss Carman we think more of mind and heart than of legs. No one reading his "The Joys of the Road" would think of him as hurrying. He contemplates and uplifts. His vagabondage sees things aright and gets their inner meaning. No one has portrayed more perfectly nor beautifully the joys of the road in autumn. Every nature lover should know the poem. It is almost impossible to select a quotation since the entire poem might well be considered a single sentence, a leisurely sentence wandering along a delightful October road only now and then to pause but not really to stop. The thought goes on, one joy leads to another so rapidly as to fill the mind with a constantly recurring panorama of beautiful pictures. Thus he swings off leisurely:

Now the joys of the road are chiefly these:
A crimson touch on the hard-wood trees;

A vagrant's morning wide and blue,
In early fall, when the wind walks, too;



BLISS CARMAN of New Canaan, Connecticut

A shadowy highway cool and brown,
Alluring up and enticing down

From rippled water to dappled swamp,
From purple glory to scarlet pomp;

The outward eye, the quiet will,
And the striding heart from hill to hill;

The tempter apple over the fence;
The cobweb bloom on the yellow quince;

The palish asters along the wood,—
A lyric touch of the solitude;

An open hand, an easy shoe,
And a hope to make the day go through,—

Stop to get step there, the poem like
the walker goes for home:

Who never defers and never demands,
But, smiling, takes the world in his hands,—

Seeing it good as when God first saw
And gave it the weight of his will for law.

The poems, "Songs from Vagabondia," also "More Songs from Vagabondia" and "Last Songs from Vagabondia," were written in cooperation with his fellow traveler, Richard Hovey, who died. "Echoes from Vagabondia" were written by Mr. Carman. These delightful little books are published by Small, Maynard and Company, Boston, Mass., and should be familiar to every nature lover.

"The Rough Rider and Other Poems," published by Mitchell Kennerly of New York City, contains some charming bits of nourishment for every nature lover. In this are two poems with especial local interest. "Easter Eve" refers to Lake Wampanaw of New Canaan and the accompanying illustration shows Mr. Carman standing by that Lake in meditation, and he asks in a way that startles the reader, suppose while going from town on Wednesday he had met Christ walking on Ponus Street?

Then let me ask you, Last December, when
there was skating on Wampanaw,
Among the weeds and sticks and grasses under
the hard black ice I saw
An old mud-turtle poking about, as if he
were putting his house to rights,
Stiff with the cold perhaps, yet knowing
enough to prepare for the winter nights.

Well, I have an instinct as fine and valid,
surely, as that of the beasts and birds,
Concerning death and the life immortal, too
deep for logic, too vague for words.
No trace of beauty can pass or perish, but
other beauty is somewhere born;
No seed of truth or good be planted, but
the yield must grow as the growing corn.

Therefore this ardent mind and spirit I give
to the glowing days of earth,
To be wrought by the Lord of life to something
of lasting import and lovely worth.
If the toil I give be without self-seeking,
bestowed to the limit of will and power,
To fashion after some form ideal the instant
task and the waiting hour,

It matters not though defeat undo me, though
faults betray me and sorrows scar,
Already I share the life eternal with the April
buds and the evening star.

Our minister here, entrenched in doctrine,
may know no doubt upon Easter Eve.
And when it comes to the crucial question,
Doctor, you skeptic, you too believe!

Another delightful poem with local reference is "On Ponus Ridge." In the first stanza he propounds a question, an answer to which he finds on Ponus Ridge:

I heard the voice of our mother planet murmur
to-day as the south wind blew
Over the old Connecticut granite, up from the
Sound and the rainy blue.

"What is your comment, wandering brother," said Ponus Ridge to the striding rain,
"Not on the new word, *Love one another*,
but the harder text, *Ye shall rise again?*"

It is difficult to do justice to this poem without quoting it all, but this stanza is a sample of the beautiful thoughts that crowd the author's mind and seek expression:

Here all day long I shall lie and ponder the
teeming life whereon I brood,
While the buds unfold, the low clouds wander,
and all things flow to rhythm and mood.
And seeing all form but the trace of motion,
all beauty the vestige of joy made plain,
Shall I stint my care and my devotion, to
vex me with counting the once or again?

One can but think of Bliss Carman somewhat as of John Howard Payne. Tenderly beautiful in thought, affectionate in spirit, Bliss Carman lives his life alone; he has no home. He engages a room at one house near the railroad station in New Canaan, and takes his meals in another. He is not surrounded by relatives, he knows not the joys of home life though he has enriched thousands of homes by the tenderly beautiful, loving spirit of his poetry. He who has sung for the delight of many a home is, as he himself says, a vagabond. Ask at the station in New Canaan, "Where is Mr. Carman's home?" and the answer is, "I suppose you mean that man who writes for magazines and wears a broad-brimmed hat. He has no home; he boards over there. I don't believe, Mister, you will find him at home; he goes walking over the hills and through the woods and perhaps you will find him on the lake where he spends much of his time."

Is vagabondage commendable? As exemplified by Bliss Carman, it is.

Is Carman singing a new song? No, it is the old, old story of Him who walked with His disciples in the open road, who drew His lessons from the lilies in the field, from the vineyards that He passed, from the birds that He saw and



“HE GOES WALKING OVER THE HILLS AND THROUGH THE WOODS.”

from the farmer's boy feeding the pigs, whose acquaintance He had probably made, and from whom He drew his most touching lesson. These thoughts must have been running through Bliss Carman's mind when he asked the astonishing question, Suppose one were to meet Christ right on ordinary, everyday, commonplace Ponus Street, what then is to be done? It is to think His thoughts and draw His lessons from nature and realize, as Ponus Ridge said to the striding rain, there is a greater question than "Love one another," the harder task, "Ye shall rise again." Bliss Carman is showing the sacredness of commonplace nature, making really a *new* Canaan and in the years to come that sacredness of thought shall more and more be credited to this master poet whose head and heart tower literally and emblematically farther toward heaven than those of most men while his feet tread commonplace earth.

The man is blessed who every day is permitted to behold anything so pure and serene as the western sky at sunset, while revolutions vex the world—Thoreau.

**From James Whitcomb Riley's
Secretary.**

Indianapolis, Ind., April 17, 1915.
Dear Mr. Bigelow:

Your letter has been forwarded to Mr. Riley in the South where he has no secretary. I know he will make a special effort to write what you request because of his friendship both for you and Mr. Carman.

May 7th, 1915.

Mr. Riley, who isn't able to take up the pen, says he has expressed his appreciation and love for Bliss Carman in the poem which I am enclosing. He is sorry that his health is such that it is difficult for him to write anything new. "There is nothing I would not do or say for Carman," he tells me. "He is a fine, knightly man, poet and scholar."

TO BLISS CARMAN.

He is the morning's poet—
The bard of mount and moor,
The minstrel fine of dewy shine,
The dawning's troubadour:

The brother of the bluebird,
'Mid blossoms, throng on throng,
Whose singing calls, o'er orchard walls,
Seem glitterings of song.

He meets, with brow uncovered,
 The sunrise through the mist,
 With raptured eyes that range the skies
 And seas of amethyst:

The brambled rose clings to him;
 The breezy wood receives
 Him as the guest she loves the best
 And laughs through all her leaves:

Pan and his nymphs and dryads
 They hear, in breathless pause,
 This earth-born wight lilt his delight,
 And envy him because

He is the morning's poet—
 The bard of mount and moor,
 The minstrel fine of dewy shine,
 The dawning's troubadour.

Stamford Salutes New Canaan.

BY CHARLES H. CRANDALL, STAMFORD, CT.

Bliss Carman? Certainly. To know him is to know one whose head is in the clouds (he is considerably over six feet), so it is easy for him to see visions which escape common mortals, as an officer looks over the trenches by means of a periscope. When you are a poet, and in good working order, you can see over

mountain tops and around corners. It is therefore no wonder that Carman can extract wisdom from the turtle in Lake Wampanaw or stroll over Ponus Ridge and fancy himself walking in the footsteps of Socrates, and gather up a fine crop of philosophy as the fruit of his walk. I have chatted with our serene and lofty poet in his tent in the woods near New Canaan and envied him his air of illimitable leisure, his calm serenity and unruffled poise. But I am out of patience with the shade of my old friend, E. C. Stedman, who, in making up his anthologies of verse, failed to class Carman as an American, but must remind us that he was born under the aegis of "Our Lady of the Snows," in far-away Labrador or New Brunswick or Scotia, where even the wild geese cannot stand the winters. Having all the sense of the goose, and then some (and mind you, wild geese know a lot that we do not). Mr. Carman took flight from Canadian wilds to old New York town many years ago and has been tramping over the Catskills and the New Canaan hills



"CARMAN CAN EXTRACT WISDOM FROM THE TURTLE IN LAKE WAMPANAW?"

for decades more or less. So I call him an American, as he is to all intents and purposes. I speak of Stedman's classifications because I wanted to tell a lady where to find his "Make Me Over, Mother April," and did not find him in the group of American poets. Read this poem of his if you wish to find Carman in one of his choicest moods, when he revels in rhyme and rhythm and daring characterization of nature, a wild sort of Bohemian chant such as stirred his blood in the young days when he hit the woodland trails and the open road with Richard Hovey and gave the world those wild, rollicking, careless, lawless "Songs of Vagabondia." May he always renew his youth whenever he chooses to hit the open road.

Tribute from William Hayes Ward.

South Berwick, Maine.

To the Editor:

Yes, Bliss Carman was for a while office editor of "The Independent" while I was editor and his companionship in the office it is a pleasure to recall. He was in his youth a tall blonde, with statuesque head and long hair and open neck: very quiet and unassuming, dreamy, yet companionable. He was much with his cousins, the Robertses, whose literary ambitions had brought this exceptionally gifted family to New York. It was about this time that he did his tramping with his poet friend, Richard Hovey, whose early death was a sad loss to American literature. The fruit of these wanderings appear in his "Vagabondia," and he mentioned his companion under the name of "Dickon. Such poems as "The Quaker Ladies" and the "Easter Market" at Washington, very simple and delightful, were not easily forgotten, and ought not to be, although probably they cost him much less labor than his longer poems of which I mention only the "Coronation Ode" on the accession of King Edward, for he was a loyal Canadian. "The Independent" published many of his verses. Of course he wrote prose, if not so much as did his cousin, Charles G. D. Roberts. We are indebted to New Brunswick for a family of unusual worth. The senior Roberts was an Episcopal clergyman of much distinction, and his three sons, Charles, William and Theodore, and a

married daughter, were all successful authors.

WILLIAM HAYES WARD,
Honorary Editor of "The Independent."

"Associations" of Plants and Birds.

Dr. Arthur A. Allen, of Cornell University, in a paper before the Biological society of Washington, recognizes seven "associations" of plant and bird life between pond or river on the one side and field and forest on the other. These are, in order:

1. The Open Water Association. Here the plants are important sources of food but do not provide nesting places for any birds.

2. The Shoreline Association. This provides little food. One of the few birds inhabiting it is the pied-billed grebe.

3. The Cat-tail Association. Here as a favorite locality for such birds as the least bitterns, coots, and various rails. The red-winged blackbird, though having a wide range over various sorts of country prefers this belt.

4. The Sedge Association. Marsh wren, ordinary bittern, swamp sparrow, and marsh hawk, are among the birds of this district.

5. The Grass Association, of which song sparrow and Maryland yellow-throat are typical inhabitants.

6. The Alder-Willow Association, with the green heron and alder fly-catcher among nesting species.

7. The Elm-Maple Association, where dwell a large variety of woodland birds, while several species nest here which get their living in other regions.

The commonest and cheapest sounds, as the barking of a dog, produce the same effect on fresh and healthy ears that the rarest music does. It depends on your appetite for sound. Just as a crust is sweeter to a healthy appetite than confectionery to a pampered or diseased one. It is better that these cheap sounds be music to us than that we have the rarest ears for music in any other sense. I have lain awake at night many a time to think of the barking of a dog which I had heard long before, bathing my being again in those waves of sound, as a frequenter of the opera might lie awake remembering the music he had heard—Thoreau.

Campfire Photographs at Night.

One of the simplest yet most effective and striking flash-light photographs that one can make is a camp fire flash-light. All we need is a camera, a camp fire and about three of the flash sheets that can be had of any photograph dealer. First pile on a lot of wood and let your camp fire burn until you have a big bed of red

between the camera and the fire we must have three or four figures standing close together. This is to shield the camera from the glare of the flash which might give up that fuzzy effect called halation. Now we give our flash sheets or powder to one of the boys sitting close to the fire with instructions to toss it into the hottest part of the bed of coals at our



A CAMP FIRE PHOTOGRAPHED AT NIGHT.

hot coals but no fire to speak of. Now then, place your camera at a convenient distance from the fire so you can include your group, say about twenty feet. The camera must be on some firm support for this will be a time exposure. If you have no tripod set it on a log, tree stump, camp chair or anything that is handy. Now then, set the shutter for a time exposure. Now our camera is ready and it is time to arrange our group. Oh, yes, I forgot to mention that you focus on the fire if it is a focusing camera. My reason for fixing the camera first is not to have our subjects sitting close to the hot fire any longer than is necessary. Sometimes they get too hot while waiting for the photographer to get ready and refuse to pose. Now we arrange our party in a circle about the fire, sitting, kneeling or in natural attitudes, but just

word of command. Then just before taking the picture we gather up a bunch of damp leaves or green grass and throw it on the fire. Immediately there rises up a cloud of dense white smoke which is very essential to our picture. Then we step back to our waiting camera, open the shutter, give the word of command to our assistant to throw the flash into the hot part of the fire. "Bing!" off goes the flash; we close our shutter and the picture is made. It is well to caution your group to look at the fire or each other and not at the camera for this spoils the naturalness of the effect.

[Photograph, with instructions, from Brown and Dawson, Stamford, Conn., and copyrighted by them.]

The National Museums of Peru have had to be closed as a result of the hard times which have followed the war.

Natures Studies in and Around Washington, D. C.

BY R. W. SHUFELDT, M. D.

OF ALL THE CITIES in this country few there are that can offer the amateurs and professionals in any of the departments of natural science, botany, agriculture, and their allied callings, more advantages in the way of libraries, museums, and delightful variety in the surrounding country than can the city of Washington—our Capital. Moreover, Washington holds in its society an unusually large number of people who are more than interested in such pursuits, for the city is the home of a great many distinguished men and

venient to consult everything that has been published along the lines of biology in its broadest sense. The many museums have superb public exhibits of natural history material of every description, and collections for the use of students, containing thousands upon thousands of specimens from every division and kingdom in nature.

Situated as the city is upon the Potomac river, one naturally finds present the usual river faunæ as they occur in this part of the world: a few interesting mammals for study; a long list of water



FIG. 1. A GROUP OF WASHINGTON FOLK WHO BELIEVE IN THE COUNTRYSIDE LIFE.

women of science, and of a considerable body of those that take up such studies in a non-professional way. To these and others we may add a very large assemblage of those devoted to amateur pursuits along similar lines, and they, in turn, have their host of friends in that charming class now usually designated as the nature lovers. In short, we have an army of such people, ranging all the way from a strict closet naturalist to the jolly soul who takes to the timber just for the love of it, in that he or she may be as close to nature as possible all the time.

We have several large libraries in Washington, rendering it easy and con-

venient to consult everything that has been published along the lines of biology in its broadest sense. The many museums have superb public exhibits of natural history material of every description, and collections for the use of students, containing thousands upon thousands of specimens from every division and kingdom in nature.

The summer of 1914 was a particularly lovely one—all the way from the middle of April to the last days of October, and even a good ways into November. My wife and I enjoyed a score or more of fine tramps in various directions; and



FIG. 2. A SCENE IN NORTHERN VIRGINIA.

upon one memorable occasion a party was made up which included Mr. C. W. Gilmore, who has charge of the fossil birds and reptiles in the U. S. National Museum; Mrs. Gilmore, their three beautiful little daughters, Mrs. Coutant, Mrs. Gilmore's mother; Mrs. Shufeldt, and the subscriber. The latter is responsible for perpetuating this squad of true nature lovers, as shown in Figure 1, wherein Mr. Gilmore declines to apologize for smoking in the presence of ladies, while the latter told me afterwards that they wished they had taken their hats off, as these were not altogether up to date.

In these tramps we by no means confine ourselves to the District of Columbia; for, owing to the splendid system of electric cars running out from the city in all directions, it requires but short spaces of time to take in much of southern Maryland, northern Virginia, and by an extra jaunt, soon land at the shores of Chesapeake Bay, which in all respects offers nearly everything that one finds at the seashore.

Some parts of Virginia are as attrac-

tive as anything that can well be imagined. In Figures 2 and 3 we have wood and farm scenes in old Virginia, just over the river from Washington; and did you ever see such a wealth of daisies as we have in the foreground of Figure 3, or a farmhouse more snugly sheltered in the encircling woodland?

When wife and I take to the countryside, we are after things. We are not only rigged out for the tramp, but all sorts of collecting traps, a 5 x 8 camera, and other necessities go along with us. If I chance to be studying box tortoises at home—their life histories, variations, and so on—then box tortoises are in order, and five or six of them are duly collected. These are subsequently to be photographed in my study (Fig. 4), and to be observed and examined in various ways as material for monographic work. In some parts of Virginia these reptiles are remarkably abundant and exhibit wide variations in their coloring. One day we found where one had crawled into an empty tin preserving-can and died there. It was apparently long ago, and only its skeleton was in evidence.



FIG. 3. A FARMHOUSE IN NORTHERN VIRGINIA

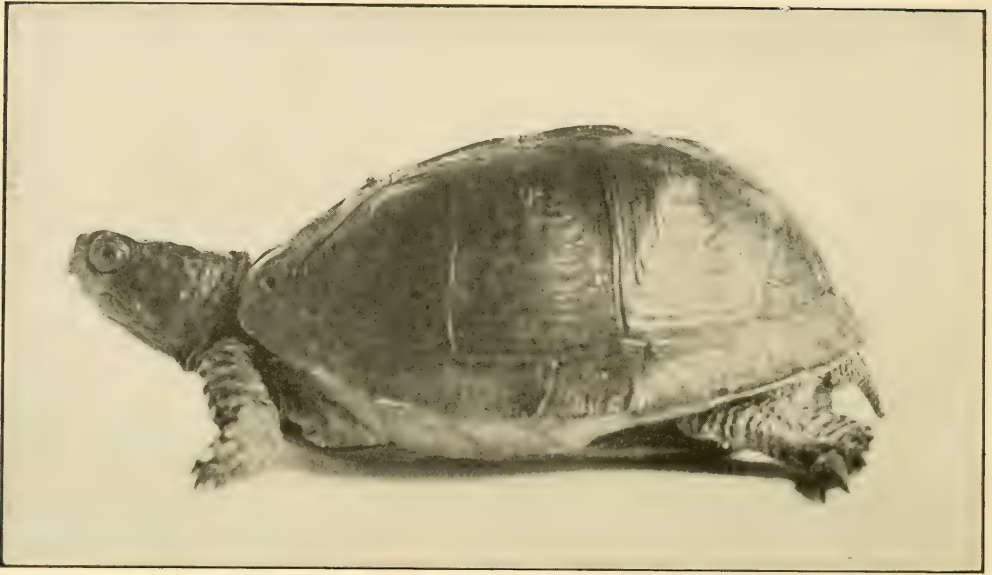


FIG. 4. AN OLD BOX TORTOISE.

This was nearly complete, and thus saved me some trouble in another direction which I need not mention now.

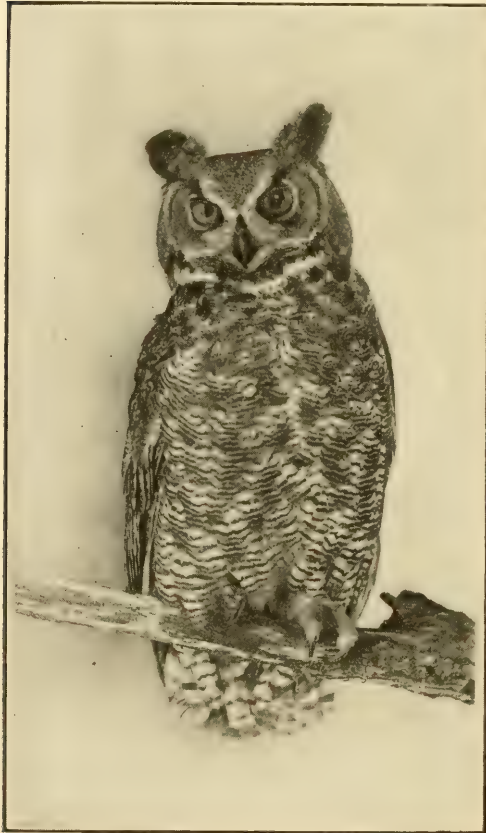


FIG. 5. THE GREAT HORNED OWL.

As I am preparing a work on the natural history of this region, we allow nothing to escape us, and with my camera, during the past few seasons, I have made two or three hundred most beautiful negatives, photographs from which will be used as illustrations to the forthcoming manual.

The ornithology of the country is most interesting, and is now very thoroughly protected by the recent bird laws. This has preserved even some of the largest raptorial birds, and on the river one occasionally sees the white-headed eagle soaring majestically overhead, while in the timbered sections I have sometimes met with the great horned owl—the young and old of this species being here shown in Figures 5 and 6, captive specimens which I photographed for my work.

Down in the marshes we have the noisy little marsh wrens, which build nests out of the cat-tail leaves in communities, each having the form of a coconut, with a hole at the side for an entrance. They also build here and there “mock-nests,” apparently with the hope that their enemies, in hunting for nests containing their eggs, might, in coming across these, become discouraged or perhaps think that all the nests in sight were deceptions, and so give up their search. Unfortunately, this little scheme rarely succeeds. Snakes get many of their eggs, especially those found in and

around the marsh-lands, as the deadly "copperhead," the young of which species is seen in Figure 8,—a Virginia specimen which I photographed and subsequently placed in the National Museum collections.

Of all my studies and photographic work, none is more fascinating than the insects and flowers of this region, and every year that goes by adds forty or fifty new subjects to my collection. As I write these lines I am yearning for the

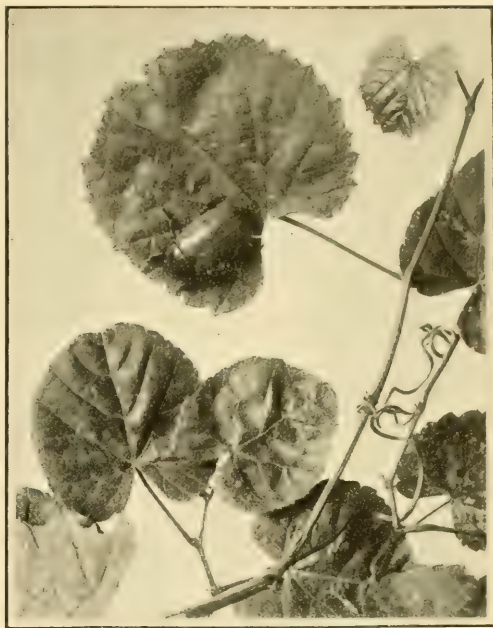


FIG. 7. THE SPOTTED PELIDNOTA OR GRAPEVINE BEETLE.

"bluets" and the crow- or bird-foot violets to show themselves again, peeping up amid the dead leaves of last year's growth. A beautiful bunch of bluets are shown in Fig. 10, which I took last year in Maryland, just a little ways from our home.

Insect life is very abundant here; and over thirty years ago the veteran entomologist of the U. S. Department of Agriculture, the late Charles Valentine Riley, told me that, by careful search, there were still new species of the smaller forms of insects to be described for the District of Columbia and northern Virginia. Few contributed more to this subject than Professor Riley, and especially along the line of those species of insects which are the enemies of the agriculturist, or destroyed our shade-

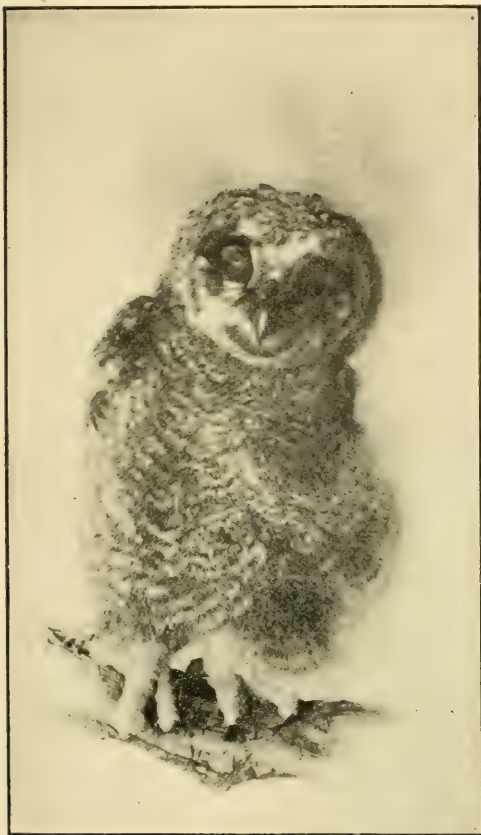


FIG. 6. THE YOUNG OF THE GREAT HORNED OWL.



FIG. 8. YOUNG COPPERHEAD VIPER OR SNAKE.
Not to be trusted at this age, and very venomous when older.

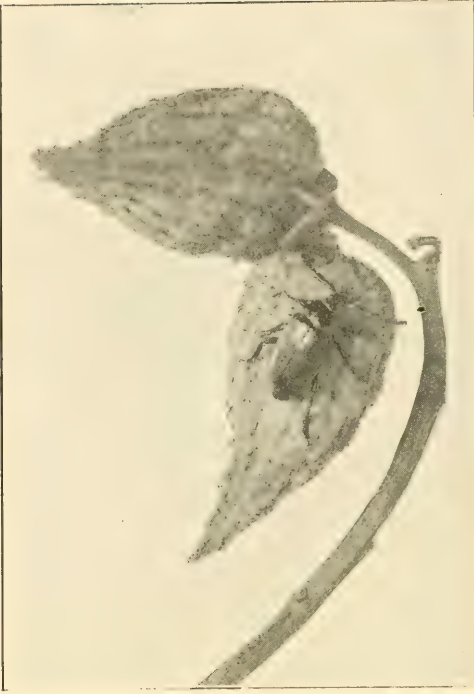


FIG. 9. THE BROAD-NECKED PRIONUS.

trees, or were pests in other ways.

Out of my large collection of insect photographs taken in this region, I select two for reproduction here,—the one shown in Fig. 7 being the "Spotted Pelidnota," which often does great damage to the wild and cultivated grape-vines during the summer months; the other subject (Fig. 9) is the well-known "Broad-necked Prionus," the larvæ of which feed upon the roots of the grape-vine, and which doubtless is a harmful insect in other ways.

Many of the moths and butterflies of the District are very beautiful, and a display-collection of these, together with other insects, is now being made for one of the exhibition-rooms at the U. S. National Museum. This is very convenient for study, and of great assistance to those interested in this particular and important branch of zoology.



FIG. 10. A BEAUTIFUL BUNCH OF "BLUETS."



Bee Buccaneers.

BY JOHN H. LOVELL, WALDBORO, MAINE.

The diligence of bees is proverbial, and they have long been held up as models of industry in both prose and poetry. It is then with no small astonishment that we learn that there are idle bees, which have given up nest building and storing supplies; and live wholly, as regards brood rearing, at the expense of their neighbors. Like robbers, as they are, they steal into the homes of the rightful owners of the nests, when they are away, and lay their eggs on the balls of bee-bread. They are called guest-bees, brood parasites, orinquilines; while their unconscious victims are known as host-bees.

The guest-bees are usually allied in structure with their hosts, and both are probably derived from the same primitive stock, thus the false bumblebees, which live in the nests of bumblebees, are commonly mistaken for bumblebees, and both doubtless had a common ancestry. The origin of this habit is not perhaps wholly clear, but it is only one of many manifestations in nature of a widespread tendency among animals and plants, not excepting the human race, to live at the expense of others when there is an opportunity. Common genera of parasitic bees in the eastern states are *Nomada*, *Coelioxys*, *Stelis*, *Melecta*, and *Psithyrus*, or the false bumblebees. (Fig. 1).

Of the lives and adventures of these bold buccaneers of the air we know little:

"His morals are mixed, but his will is fixed;

He prospers after his kind,
And follows an instinct, compass-sure,
The philosophers call blind.

And that is why, when he comes to die,
He'll have an easier sentence,

Than some one I know who thinks just so.

And then leaves room for repentance."

The way in which a parasitic bee enters the burrow of a nest bee is thus described by Dr. Graenicher: A parasitic bee (*Triepeolus minimus* comes flying

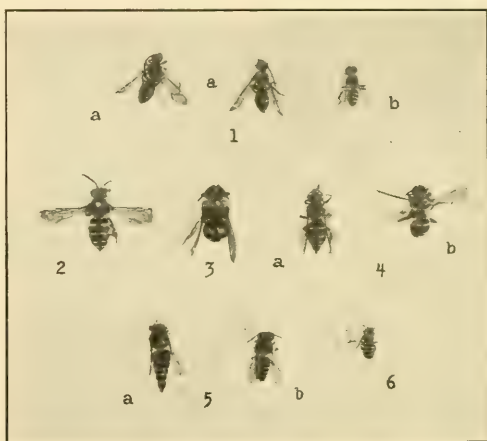


FIG. 1. COMMON PARASITIC BEES.

1. *Nomada bella*: a, female; b, male.
2. *Melecta miranda*, female.
3. *Melecta interrupta*, female.
4. *Triepeolus donatus*: a, female; b, male.
5. *Coelioxys rufitarsis*: a, female; b, male.
6. *Stelis foederalis*, female.

over a clay-bank examining every hole and crevice in search of the nest of a host-bee. When it discovers the burrow of *Colletes eulophi* it becomes greatly excited, crawling around with quivering wings, looking into the tunnel but not entering. It soon takes up a position on a small plant, and waits patiently until the owner arrives with its load of pollen and honey and disappears in the nest. After the departure of the host-bee the parasite enters the nest where it remains about a minute. It then spends nearly six minutes in studying the territory around the nest in order that it may easily locate it again. For several successive days it returns and at the right time deposits an

egg on the bee-bread (a mixture of nectar and pollen). At last the nest is definitely closed by its owner (*Colletes eulophi*) and both bees disappear to return no more.

Another parasitic bee (*Stelis maculata*) lays her eggs in the nests of *Alcidamea*

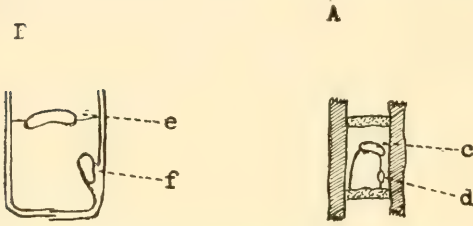


FIG. 2. DIAGRAMS OF SECTIONS OF CELLS.

A. Diagram of a section lengthwise through a cell from the nest of *Alcidamea producta*: c, egg of host bee, *Alcidamea producta*; d, egg of parasitic bee, *Stelis sexmaculata*.

B. Diagram of section lengthwise through lower half of cell of *Megachile latimanus*: e, egg of host bee, *Megachile latimanus*; f, egg of parasitic bee, *Coelioxys rufitarsis*. Notice that the egg of the parasitic bee is concealed on the side of the mass of bee bread. (After Graenicher).

damea producta. The nest of *Alcidamea producta* is a tunnel in the pith of the dry stem of the blackberry or sumac. At the bottom there is stored a conical mass of bee-bread on the top of which *Alcidamea* lays her egg; during the absence of the host-bee the parasite *Stelis* enters the tunnel and lays an egg on the side near the base of the bee-bread. (Fig. 2). The host-bee may build as many as four such cells, one over the other, closing each with a felt-like mass of chewed strawberry leaves.

Let us now enter the nest and observe the tragic end which awaits the rightful heir. According to Dr. Graenicher both

eggs hatch at nearly the same time. The larva of the parasite is armed with long sharp mandibles; but those of the host larva are blunt and bifid and not well adapted either for defense or attack—so the latter is doomed from the beginning. When the two larvae meet, while feeding on the bee-bread, the parasite seizes the body of the host-larva between its sharp mandibles. The latter may struggle a little but soon succumbs; after sucking out the liquid contents of its host the parasite resumes feeding on the bee-bread. If the host bee lays two eggs in the same cell, the larvae can not injure each other; but if there are two larvae of the parasite a combat is certain to result, and the victor is the larva obtaining the first hold on the body of the other.

The handsomest parasitic bees belong to the genus *Nomada*, and Smith calls them most beautiful of all the genera found in Great Britain. They are often called wasp-bees, "because of their gay coloring." They are dark red in color, often suffused partially with black, and maculated with bright or pale yellow (a yellow streak is certainly a fitting color for these bees). The males are much more yellow than the females. As the females no longer gather pollen they have largely lost the hair brushes used for this purpose. They lay their eggs in the burrows of the ground bees (*Andrena*). They occur chiefly north of the equator, and are more abundant in western than in eastern North America.

In New England there are two species of false bumblebees, of the genus *Psithyrus*, which live in the nests of the bumblebees. In appearance they closely resemble bumblebees, and are no doubt derived from the same ancestral stock. They produce no workers, only males and females, which would appeal to a certain type of socialists as an ideal state of affairs. They were long supposed to be merely commensals, living with the bumblebees but doing no harm. Their economy, however, has recently been fully described by Sladen. The female *Psithyrus* attacks and kills the bumblebee queen and takes possession of the nest; but with cunning foresight she waits until a sufficient number of eggs have been laid to provide a force of bumblebee workers large enough to provide for herself and her brood. Sometimes she waits too long and enters a colony with a strong company of workers, and is fu-

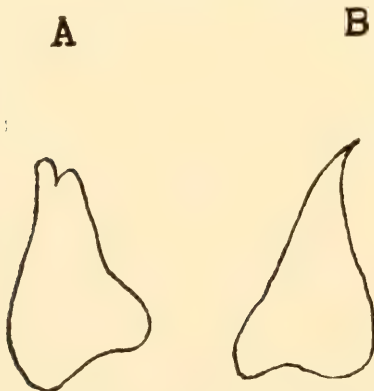


FIG. 3. MANDIBLES OF LARVAE.

A. Mandible of larva of host bee, *Alcidamea producta*. Notice that it is blunt and bifid, adapted neither for attack nor defense.

B. Acutely pointed mandible of larva of parasitic bee, *Stelis sexmaculata*, with which it pierces the body of the host larva. (After Graenicher).

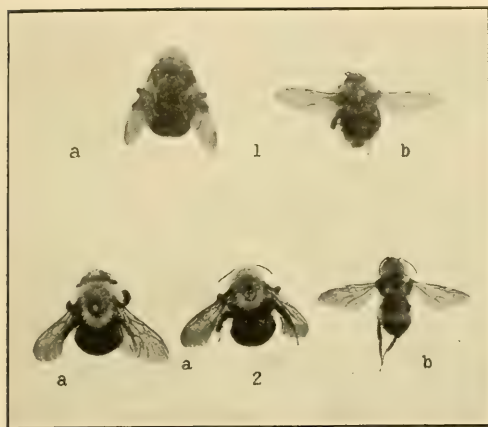


FIG. 4. TWO COMMON FALSE BUMBLEBEES.

1. *Psithyrus ashtoni*: a, female; b, male.

2. *Psithyrus laboriosus*: a, female; b, male.

riously assailed, overcome and slain. Females of the false bumblebees do not fight with each other. So little is known about American bumblebees that they offer a most interesting field for study. (Fig. 4).

While according to human ethical standards there are pirates of the air among the bees, the group as a whole is of inestimable value in the pollination of flowers. In the absence of insect visits a great number of flowers would remain infertile, for example, a large part of our fruits, as apples, pears, plums, sweet cherries, grapes, cucumbers and squashes, in the absence of insects, are largely or wholly unproductive. As pollinators the bees easily surpass all other insects in importance. As they all live on flower food in both the larval and adult stages, they are compelled constantly to visit flowers. In the spring the air around the catkins of the willows and the bloom of the plum trees is filled with wild bees. But the collector should examine every conspicuous flower, for some bees fly only in spring, others only in autumn. Bees with a short term of flight, as a month or two, often restrict their visits almost entirely to to one kind of common flower, as the willows, golden-rods and asters, which yield an abundance of pollen and nectar.

There is no more fascinating study than the relations of flowers and insects, and in the words of Hermann Mueller the flowers extend to you this invitation:

"Only venture to come to me, and in true love make yourself acquainted with me and all my conditions of life, as in-

timately as you may, and I am ready to let fall the veil which hides me, and trust myself and all my secrets to you."

Which Bees Swarm Out?

Gentryville, Indiana.

To the Editor:—

I shall feel greatly obliged to you if you will kindly answer the following question: Do young or old bees leave the hive in the swarm?

Halligan in his "Fundamentals of Agriculture," states that the old bees swarm, while T. Chalmers Potter in his booklet, "Beekeeping for Sedentary Folk," states that the young bees swarm.

Assuring you that your answer will be greatly appreciated,

I am,

Very truly yours,

J. B. HARTER.

You are both right and wrong. The fact is, that both young bees and old bees go out with the swarm. The very young bees, of course, are left with the young brood to take care of them. Practically speaking, the average swarm is made up of drones of all ages, bees of all ages, but mainly field bees and young bees that are old enough to go to the fields, or old enough to go out and indulge in the play spells out in front of the entrance of the hive on bright sunny days.—The A. I. Root Company.

An English naturalist reports two different male blackbirds which chanced, early in the mating season, to catch sight of their own reflections in a windowpane and came back every day to fight it. The one kept up the visionary combat during an entire month, the other throughout the spring. Neither bird appeared to have the least capacity to profit by experience.

During the recent siege of Antwerp, the famous Zoological Gardens belonging to the city received only a single hostile shell, which fell among the turtles and did little damage. Before the bombardment began, however, the management thought it wisest to shoot all the bears; and later after the city took fire, all the large carnivora were likewise disposed of, as well as the venomous serpents. Otherwise the institution has suffered little except for lack of money.

Ants' Heads Do Walk About.

In our May number we quoted from "The American Botanist" an article entitled, "Interesting But Not True." We suggest that in criticising others, one should say nothing that may be criticised by those others. The following letters are self-explanatory:

Washington, D. C.

To the Editor:

I am enclosing a page from your May number of THE GUIDE TO NATURE with a slight correction. It so happens that, so far as I know, I was the first to report the facts about an "ant's head walking by itself without a body."

I take the following from my notebook of July 10th, 1887, the facts afterwards being reported to the Entomological Society here: "Hollis, N. H., July 10.

"While sitting on the front steps I noticed the headless bodies of some black ants (*Camponotus pennsylvanicus*) which were still alive. On looking around carefully I found several heads lying detached. On examination each head was found to be occupied by a small, live, white worm. They were able to move around by keeping the head on its flat (posterior) surface and by elongating themselves, pushing their house backward—"

Several years later Mr. E. A. Schwartz of the Agricultural Department reported a full study of the subject and identified the adult of the worm as a parasitic fly (?) which deposited its eggs on the back of the ant's head.

"The American Botanist," from which you quote should change its quotation to, Be sure you are right, then go ahead.

Sincerely yours,

WILLIAM H. FOX, M. D.

* * *

Washington, D. C.

To the Editor:

I have yours of the 4th, with letter from Dr. William H. Fox of this city and clipping from the May number of THE GUIDE TO NATURE. Doctor Fox is correct, with the single exception that the man who wrote the second article conveying the determination of the parasite and so on was not Mr. E. A. Schwarz, but Mr. Theodore Pergande of this Bureau. You will find an account of this curious phenomenon of an ant's head apparently walking by itself in my

"Insect Book" published by Doubleday Page & Co., on pages 147-148, under the head of "The Hump-backed Flies (Family Phoridae)." I quote:

"Life History of the Ant-Decapitating Fly

(*Apocephalus pergandei* Coquillett.)

"It would be rather a misnomer to call this a typical life history since this form seems peculiar in its habits and rather aberrant among the Phoridae, but the observations which have been made upon it by Dr. W. H. Fox and Mr. Theo. Pergande have been more complete than any which have been made upon other members of the family, so it is here included. A common black ant (*Camponotus pennsylvanicus*) is the host of this little hump-backed fly. In the District of Columbia and in New Hampshire the fly may be found in midsummer darting about the moving ants on tree trunks and elsewhere and finally succeeding in laying its egg, sometimes after a struggle, on the neck of the ant. The egg hatches and the young larva bores directly into the head of the ant. As it enlarges it eats out the whole head cavity, the head breaks off from the body of the ant and moves about independently, propelled by the body of the contained maggot which extrudes partly from the neck hole. The larva of the fly transforms to pupa with the last larval skin in the cut off ant's head and the adult fly issues in the course of from two to three weeks. To see an ant's head walking off by itself is a curious sight, yet it is common enough where this fly abounds. Dr. Fox named it, appropriately enough, 'the ant-decapitating fly.'"

Sincerely yours,

L. O. HOWARD,
Chief of Bureau.

The latest of the long series of monographs on "The Natural History of New England" brought out by the Boston Society of Natural History is by W. C. Kendall, associate of the United States Bureau of Fisheries. It comprises part I of a proposed monograph on the salmon family, and is given over exclusively to the trouts. In addition to the usual minute descriptions in the hundred quarto pages, there is much historical information, together with seven large and beautifully colored plates.

THE MINERAL COLLECTOR

Mica and Isinglass.

BY ROBERT SPARKS WALKER, CHATTANOOGA, TENN.

Mica is not isinglass. There is a group of minerals classified under the name mica, such as muscovite, paragonite, lepidolite, biotite, etc.; the illustration

crystallize in the monoclinic system. The various species are characterized by a basal cleavage yielding tough scales, which vary from colorless to jet black. Muscovite is our common mica, and is generally known by the simple name mica. Colorless mica is used in stove doors, for lamp chimneys,



LARGE PIECES OF MICA OF THE MUSCOVITE VARIETY.

shows a piece of the muscovite variety, the kind most familiar to our readers. These mica minerals, consisting of aluminum silicate, with varying proportions of potassium, sodium, etc.,

in the manufacture of insulating material, of wall paper, of dynamite and as a lubricant. In the year 1900, 70,587 pounds of sheet mica were mined in the United States.

Muscovite mica is a normal constituent of granite, gneiss, and similar rocks. Deposits from which sheet mica is obtained, are found in a coarse granite called pegmatite. Its preparation is simple. When freed from rocks, it is split into blocks by the use of wedges, and then cut into various sizes.

The picture shows a view of some of the mica mined by the Ridgeway Mica Company, Ridgeway, Virginia. North Carolina furnishes nearly half the mica now used.

The Ridgeway people take out about 15,000 pounds monthly. The largest block removed weighed more than 3,000 pounds. The mine apparently contains enough mica to keep the owners busy for nearly a century.

Mica, especially sheet mica, is often referred to as isinglass. This is an erroneous application of the word, as mica and isinglass are two entirely different things.

Isinglass, the dried swimming bladder of certain fishes, is prepared by tearing the air bladder from the back of the fish, washing it in clear water, and removing the outer black skin. It is then spread on a board to dry, and to prevent shriveling, is tacked to the board. The best quality is made from sun-dried sounds. After being thus dried the sound is moistened with warm water and the interior glossy skin removed by rubbing. It is then pressed between two highly polished iron rollers. If it is desired to extract the gelatin, which sometimes amounts to more than ninety per cent., the sound is bleached in a sulphuric acid solution. This causes it to swell into a mass, which, when dry, is bright and colorless.

Pure isinglass should be free from odor and taste. If not tasteless, it is not pure. It is used for the same purposes as gelatin, and in cement. It is the isinglass in court plaster that makes the plaster adhesive.

Isinglass is prepared in many countries, but principally in Manila, Canada, Brazil, Russia, West Indies and East Indies. The best is probably that from the sturgeon, but the bladders of cod and other fish furnish a good quality—From the "Southern Fruit Grower," by permission.

A grandson of Charles Darwin, himself a scientific man of no small parts, has perished in Flanders.

Copper Rocks and Boulders in Sound Beach.

ARCADIA has recently received from the mines of the Calumet and Hecla Mining Company at Calumet, Michigan, two samples of native copper, one a rock weighing considerably more than a quarter of a ton, the other a boulder of forty-eight pounds. The rock has been placed in an appropriate position at the entrance to the Welcome Reception Room and as nearly under the word "Welcome" as is convenient. This seems especially fitting, since both specimens have been presented to The Agassiz Association by Mr. R. L. Agassiz, Vice President of the Calumet and Hecla Mining Company, and grandson of Louis Agassiz, for whom the scientific association is named. The Calumet and Hecla Mining Company has been so intimately connected with the name of Agassiz, and the name Agassiz is of nature, that a peculiar significance inheres in this great mass of copper as an emblem of the welcome that we extend to all to share in the benefits of this nature study institution.

The mineralogical section of ARCADIA has grown extensively in the past year. The fireplace composed of minerals from all parts of the country, mostly contributed by friends of The Agassiz Association, has acted as a nucleus, around which a large number of interesting specimens has rapidly accumulated.

The ancient superstition that gunfire, Fourth of July, and blasting, bring on rain, seems to be pretty well disposed of by the weather records of the artillery proving-ground at Shoeburyness, England. Here are tried out, almost daily, the largest guns made—yet the locality has almost the smallest rainfall in the United Kingdom.

The Oregon Experiment Station reports a flock of fifty hens with an average of 213 eggs apiece during one calendar year; with 220 for the average of the actual laying year of each particular hen. The world's champion layer, which last year produced 303 in 365 days has now brought her score to 505 and broken the two-year record. Another bird claims the astonishing total of 819 eggs in four years. The average farm hen attains from fifty to seventy-five.



TO KNOW THE STARRY HEAVENS

Contributions to the Observatory.

Sound Beach: Mr. E. B. Lockwood, \$1.00; Mrs. Robert McGinnis, \$10.00. A Friend, \$1.00; A Friend, \$2.00. Total, \$14.00.

Greenwich: Mr. A. W. W. Marshall, \$2.00; Mr. E. C. Converse, \$100.00; Mr. Arthur S. Todd, \$1.00; Mr. R. M. Wilcox, \$1.00; Mr. P. W. Hatheway, \$1.00; Mr. A. F. Rippel, \$1.00; Mr. R. L. Chamberlain, \$1.00; Mr. William S. Meany, \$2.00; Mr. Walter B. Todd, \$10.00; Mr. Francis Clark, \$1.00; Mr. Frederick C. Manvel, \$5.00. Total \$125.00

Stamford: A Friend, \$3.00; Mr. Edward A. Myrick, \$1.00; Mr. O. E. Stone, \$1.00; Mr. T. H. Kirk, \$1.00; Mr. William R. Michaels, \$1.00; Mr. George R. Close, \$1.00; Mr. B. F. Whitford, \$1.00; Voska & Otto, \$2.00; Mr. Edmund Ryan, \$1.00; Mr. C. O. Miller, \$5.00; Mr. R. H. G. Cunningham, \$10.00; Mr. George Breman, \$5.00; Mrs. Fitch A. Hoyt, \$5.00; Mr. Fitch A. Hoyt, \$25.00; Mrs. Belden B. Brown, \$3.00; Dr. J. D. Hertz, \$2.00. Total, \$67.00.

Elsewhere: Miss Hills, Oklahoma, \$5.00; Mr. Arthur A. Carey, Massachusetts, \$50.00; Mr. H. L. Cassard, Pennsylvania, \$10.00; Mr. William Tyler Olcott, Connecticut, \$1.00; A Prominent Astronomer, \$25.00; Mrs. Charles E. H. Phillips, Connecticut, \$5.00; Dr. Robert T. Morris, New York, \$5.00; Mr. H. E. Deats, New Jersey, \$5.00; Mr. Chas. A. Bruun, Missouri, \$10.00. Total, \$116.

Grand Total, \$322.00.

E. C. Converse Gives \$100.

After Reading Press Editorial He
Sends Check to Help Buy
Telescope for ARCADIA.

May 10, 1915.

Greenwich Press,
Greenwich, Conn.
Gentlemen:—

Enclosed find check for \$100 to the

order of Dr. E. F. Bigelow, for use toward the purchase of a telescope. I was interested in your article on this subject, and am desirous of helping Dr. Bigelow accomplish his laudable purpose.

Very truly yours,

E. C. CONVERSE.

In response to the editorial which appeared in this newspaper last week, asking people to help Dr. E. F. Bigelow establish an astronomical observatory at ARCADIA, in Sound Beach, E. C. Converse sent to The Press to-day the above letter, enclosing a check for One Hundred Dollars as a donation.

This is only one of the many public-spirited things that the steel magnate has done to help along the growth and welfare of Greenwich. The Press extends its thanks to Mr. Converse, in the name of the people of Greenwich.—“The Greenwich Press.”

Greenwich: What Is in the Name?

Director Schlesinger of the observatory of Allegheny, Pennsylvania, in a recent conversation made this appropriate suggestion:

“Establish an observatory in the town of Greenwich? Why, of course you should. It is the most fitting thing that could be done. It is a wonder that such an observatory was not long ago established there, merely for the carrying out of the associations suggested by the name.”

The world over, the word “Greenwich” is a synonym for astronomy and astronomical investigation. Everyone knows that the longitude of a place on the earth is the angle at the pole made by the meridian passing through the observer's place. The place from which most nations have agreed to count their time is Greenwich, England. Some of them have their own time for their own purposes, but for general purposes, as, for instance, events occurring in the sky, all refer to Greenwich time; that is,

by what the sun appears to do at Greenwich. It seems fitting that the word, "Greenwich," of Connecticut, should step forward in astronomical affairs. It is hoped that the first step toward our first popular observatory may lead to something on a larger scale, and that the word, "Greenwich," may become as famous as an observatory for the general public to view the wonders of the heavens as its great namesake is famous as a technical investigator of those wonders.

When Things Are Darkest Push Ahead.

In these times of war and other things, these are indeed dark days. We have been told that it is not financially a good time to attempt new things. It may not be a good time to accomplish new things but there is never a time when it is not best to attempt to do better work and to render more efficient services to mankind. The Agassiz Association has many problems in connection with the continuation of its present work, but we have faith to believe that through the aid of many kind friends it will go forward, and we believe also that it has a greater work to do with a larger development. The wrong time? Discouraged? Not a bit. Why we are only a short way on the Sound from the home of that famous Abraham Davenport, who on that darkest of days May 19th 1780 said work should not be discontinued but go on. It is worth while to read John Greenleaf Whittier's poem telling of that man who was not discouraged even when everything was dark.

* * * * *

From a brown homestead, where the
Sound

Drinks the small tribute of the Mianas,
Waved over by the woods of Rippowams,
And hallowed by pure lives and tranquil
deaths.

Stamford sent up to the councils of the State
Wisdom and grace in Abraham Davenport.

The low-hung sky

Was black with ominous clouds, save where
its rim

Was fringed with a dull glow, like that which
climbs

The crater's sides from the red hell below,
Birds ceased to sing, and all the barn-yard
fowls

Roosted; the cattle at the pasture bars
Lowed, and looked homeward; bats on
leathern wings

Flitted abroad: the sounds of labor died;
Men prayed, and women wept; all ears grew
sharp

To hear the doom-blast of the trumpet shatter
The black sky.

No faithless servant frightened from my task,
But ready when the Lord of the harvest calls;
And therefore, with all reverence, I would
say,

"Let God do His work, we will see to ours.
Bring in the candles." And they brought
them in.

* * * * *

In spite of the dark days in these strenuous financial times, we believe that our work is of sufficient importance to issue a call to all workers, "Bring in the candles." And I am sure that the future historian of the early days of this Institution will write as did Whittier, "And they brought them in."

The Genuine Altruistic Spirit.

Mr. Charles A. Bruun, an attorney of Kansas City, Missouri, writes:

"By all means, ARCADIA should have a telescope. Have you inaugurated a campaign? It seems to me that \$1,000 should be, and can be, raised by popular subscriptions of perhaps \$10 each. I may not often 'see through it,' but you may put me down for \$10, which will be forwarded whenever your ambitions shall have been fulfilled, or realized."

The Observatory at Sound Beach.

"Popular Astronomy" of Northfield, Minnesota, the principal publication of the United States devoted to popularizing astronomy, in its recent June-July issue, gives an extended notice regarding the efforts to establish an astronomical observatory and adds the following editorial approval:

"'Popular Astronomy' is always ready to approve and to encourage steps which will lead to wider interest in astronomy and we believe thoroughly in the usefulness of the observatory which may be frequently open to the public at regular intervals. Everyone ought to know something of the story of the universe and nothing gives more of a stimulus to the study than an occasional look through a good telescope at some of the wonders of the sky."

We Need \$700 More

Good Words for the Observatory.

I greatly rejoice that you intend putting up a new observatory in a place so well calculated for the study of heavenly phenomena.—J. S. Ricard, University of Santa Clara, Santa Clara, California.

* * * * *

I think your plan to establish an observatory a good one. No instruction is given in astronomy in any of the schools under my charge as far as I know. I hope that some instruction will be given in the High School.—Edwin C. Andrews, Superintendent The Public Schools, Greenwich, Connecticut.

* * * * *

I sincerely hope that you will succeed in your endeavor to establish an observatory. A man who has been so successful in popularizing astronomy ought to have his facilities for such service increased.—Herbert A. Howe, Director The Chamberlin Observatory, University of Denver, University Park, Colorado.

* * * * *

I am very glad to express my cordial approval, and hope that you may be successful in raising the money needed. I welcome every effort that is made to give the "man in the street" a glimpse of the wonders of the heavens.—Anne Sewill Young, John Payson Williston Observatory, Mount Holyoke College, South Hadley, Massachusetts.

* * * * *

I sympathize heartily with your purpose in wanting an astronomical observatory. I know of nothing which appeals to the imagination in a more helpful way than a study of the stars, and through the imagination to the sense of wonder that does so much to refresh the minds of people whose grooves of life are necessarily narrow.—Arthur A. Carey, Fellowship House, Waltham, Massachusetts.

* * * * *

I am glad to learn that you are undertaking the campaign for the establishment of a public observatory at Sound Beach. As you know, we have had considerable experience in this matter at the Allegheny Observatory, with highly gratifying results. I can hardly imagine any other way in popular education in which larger results can be obtained for a small outlay of money, than by giving the public access to a good telescope under the charge of a well-informed and

enthusiastic attendant. Your project deserves immediate success, and I should be glad to assist in it in any way that I can.—Frank Schlesinger, Director Allegheny Observatory of the University of Pittsburgh, Pittsburgh, Pennsylvania.

* * * * *

Your effort to get the observatory deserves the hearty approval of every one interested in astronomy and the general culture of people. I feel that it must succeed, and I wish that some person of large means may be found to establish it. Probably but few astronomers can give material aid, because most of them find the financial end the handicap in their own work.—Tilton C. H. Bouton, Hudson, New Hampshire.

* * * * *

The plan to establish an observatory at ARCADIA, Sound Beach, by Edward F. Bigelow, is a project which should be heartily supported by residents throughout this entire section. Most of us are interested in astronomy. It is generally admitted that it has great value from the utility point of view to navigators and others, but it is astronomy freed from any physical needs that Mr. Bigelow has in mind. The telescope that he proposes to erect in Sound Beach will cost about \$800, and already nearly one-half that amount has been subscribed. The earnestness of Mr. Bigelow is to be commended, and he is receiving the support of many noted astronomers in this country.—"Greenwich News and Graphic."

* * * * *

Your wish to establish an astronomical observatory for popular use in the town of Greenwich is admirable. Every town needs such an observatory. It seems especially neglectful that so large, well-populated, and very prosperous a section of the country should not have such an institution. A six-inch telescope would be the most useful. A glass of that size shows well the objects of general interest and can be turned quickly from one part of the sky to another. I sincerely hope you will be successful in establishing such an observatory "for the general diffusion of knowledge." In regard to the possibility of securing a large observatory for research work, it is the belief of most astronomers that more can be accomplished by gifts to the existing observatories than by establishing new

ones, unless some site is found offering better conditions, such as in a higher altitude or in a southern latitude. May somebody build small, well equipped observatories all over the country, as Mr. Carnegie has libraries.—Miss L. B. Allen, Observatory House, Wellesley, Massachusetts.

The Pioneer Astronomers.

Mr. Lemont Barbour of Columbia University purposes to establish a Chapter of The Agassiz Association to search for new stars, for comets, and to do general pioneer work in astronomy. He says, "My plan is to get together a number of members of the AA and assign them particular sections of the sky to observe as often as possible. These sections will not be very large, probably about the size of the constellation Auriga. The plan of work is along the lines sketched by Mr. Leon Campbell in 'Popular Astronomy' for October, 1914. The only requisites are a good star atlas (Schurig's, price \$1.00, is a good one and is not expensive, as is Proctor's) and a certain amount of perseverance. When a Nova is discovered, the person sends a note to me and a telegram to the nearest observatory for confirmation. This should be done immediately, and should merely include a statement of the Nova's location in relation to the nearest bright stars and its approximate magnitude, calculated by comparison with near by stars of known magnitude. For those possessing telescopes (there are surely some people in the AA who own telescopes) a similar but more certain work, more certain, that is, because they have charts showing the star that they are to observe and when to look for it, consists in observing stars that were once Novae, but are now rather dim. If the work appeals sufficiently to the observers, those who wish to do so may join Mr. Olcott's association of Variable Star Observers. Particulars may be had regarding this from me or from Mr. Olcott, 62 Church street, Norwich, Connecticut."

We purpose to make the new observatory at ARCADIA the center or clearing house for astronomical work with young people, with either small telescopes or good field glasses. Meetings will be held here from time to

time. Mr. Barbour cordially invites correspondence. He proposes that the motto of the new astronomical Chapter be "Per stellas ad lumen" (through the stars to enlightenment). It is probable that this plan may result in two new corresponding Chapters, one for those who have telescopes and the other an opera glass or field glass Chapter. Regarding this plan our Professor Eric Doolittle writes as follows:

"This would be an excellent plan and will prove an interesting and attractive work to those who seriously enter upon it. But I would not limit the efforts to 'new' stars, nor probably did Mr. Barbour intend this. Let each observer take a *small* area of the sky and become so familiar with it that he shall 'know it like a book.' Then upon searching the region at frequent intervals, he will at once notice *anything* new or different, whether it be a new star, a sudden variation in brightness of an old one, a comet or anything unusual.

"It would add greatly to the value and interest of this work if each observer could have at least a small telescope. Even if it were but a pair of field glasses, held firmly with heavy rubber bands to a cheap tripod, this would be a dozen times more efficient than the unaided eye. I remember that twenty-five years ago, my first professor, Professor Laenas G. Weld, of Iowa City, used to urge the desirability of thus apportioning the entire sky among professional astronomers. The idea was that each should take a small area and make a full map of it, putting in all stars visible in his telescope, their magnitudes, colors, the nebulas, clusters and everything else. Each should then sweep over his assigned region until he knows it as well as he knows the arrangement of rooms and furniture in his own house. A brief examination made each evening before he began his regular work in the observatory would then be all that would be necessary to discover if anything new had appeared, or any change had taken place, in his particular region.

"The remarkable new star in Cygnus (discovered by Schmidt of Athens in 1876) rose from invisibility to a star of the second magnitude *within two hours*. The new star in Perseus (discovered in 1901 by the Reverend T. D. Anderson,

an amateur astronomer) increased in brightness within three days until it was the brightest star in the northern heavens, Sirius alone excepted. The behavior of every new star that has appeared has been most remarkable and, generally speaking, entirely inexplicable.

"It is true that any single observer might observe for a long time without finding anything; in fact he might never find anything *new*. Yet the work would be its own reward, and there would always remain the *hope* of a striking discovery to spur him on to continue in it."

What Allegheny and Pittsburgh Have Done for Popular Astronomy.

I recently visited the astronomical observatory at Allegheny for the second time within a few months. The establishing of that observatory was indeed an inspiration. It is strictly astronomical, and strictly altruistic. It shows what may be done by an intellectual and generous community.

It was only a few years ago that Mr. John A. Brashear, an enthusiastic lover of astronomy and maker of lenses, decided to circulate a subscription paper among his friends and acquaintances and the other citizens of Allegheny and Pittsburgh.

At that time there was a small observatory in Allegheny with a thirteen inch telescope. This had been bought in 1859 by popular subscriptions. That this telescope had been appreciated for a half century was evinced by the fact that Mr. Brashear's plea for something larger and better met with an immediate and satisfactory response. The public gave generously and the observatory was erected at a cost of \$300,000. A new telescope with a thirty-inch objective was paid for by members of the Thaw family. Friends of the late Director Keeler erected a thirty inch reflecting telescope as a memorial to him. Mr. Mellon paid for a spectrograph and Mr. Porter for a solar spectrograph, various other enterprising citizens supplying other forms of apparatus, most of them as memorials. But here enters a surprising fact that shows the altruistic spirit in which it was all done. The thirty inch telescope is not used for popular observation. None of the citizens have access to it. So far as local people are concerned they receive no more benefit directly from the greater

part of the building and equipment than if the observatory were located in California. The gifts are entirely disconnected from local use. They are employed for the benefit of humanity in general. People of the vicinity are invited four evenings a week to look through the old thirteen inch public telescope and to hear a lecture on astronomy, illustrated by lantern slides. Nearly all that this observatory, the third largest in the United States, is accomplishing with its \$300,000 equipment for the people of the cities of Allegheny and Pittsburgh could be done in the Sound Beach, Connecticut, observatory, with an equipment costing not more than \$1,000. The six inch telescope that it is proposed to erect here would show practically everything that can be shown in larger observatories. The projection of astronomical slides in the Welcome Reception Room cannot be excelled by any observatory in the United States.

The great Lick Observatory, on Mount Hamilton, California, is not available to the people of the locality for astronomical purposes, but only to give tourists an incentive for a pleasing excursion from San Jose. There is no hotel on Mount Hamilton and no visitor is allowed to remain there overnight. He may look at the big telescope, but rarely through it. At Williams Bay, Wisconsin, he may look at the largest refracting telescope in the United States but never through it. No large observatory is readily available to the general public because on all fair evenings it must be used for technical work. Time is precious. Such a telescope cannot be used for even a single minute, unless its use adds to our store of astronomical knowledge. But what shall be done for the public by this accumulation of astronomical information? Just what is done in other great establishments. In commerce the large factory or wholesale house distributes through many similar but smaller establishments. The United States does not so much need more big observatories as it needs numerous places for distributing the accumulated product. Such a distributing center it is purposed to establish at Sound Beach.

When one hears that many hundreds of thousands of dollars have been spent to establish a single observatory, and that the expenses are enormous, it looks as if

an expenditure of only about \$1,000 would not accomplish much. That impression is not correct. The observatory at Sound Beach will be more available to the public than is any of the large observatories of the United States, because it will be established in the interest of the general public, while others have been established to accumulate technical knowledge.

It is popularly supposed that vastly more can be seen through these enormous telescopes than through one of medium power. The fact is that a six inch telescope, or at least one a little larger, would show practically everything that a visitor may see through the largest telescope in the world. For viewing some of the popular objects, especially the moon, the smaller telescope would be even more convenient, and in one evening would accomplish more than can be done by any of the large, unwieldy instruments.

For the purposes for which this observatory is to be established, it would not be advisable to spend much over \$10,000 even if all the money that could be desired should be available. Something a little larger than the \$1,000 equipment might be used to advantage, but it is hoped that the small equipment may lead in time to the addition of a larger. For popular use it is better to have two medium sized telescopes rather than an enormously large one. Let us have this thousand dollar equipment. The building will be small and inexpensive, but the telescope will be good enough to grace the finest observatory in the land. We understand that some of our wealthiest friends think the \$1,000 equipment will be too small to deserve their aid. It will be large enough for a beginning, and will be thoroughly effective.

The above letter was submitted to Director Schlesinger of the Allegheny Observatory, and he wrote on the date of May 29th as follows:

"The subscriptions to our new observatory amounted to \$300,000. One anonymous donor gave \$62,500. Andrew Carnegie and Mrs. William Thaw, Jr., gave \$25,000 each. These are by far the largest subscriptions, of which there were several hundred, the smallest one being for \$5. Your appeal to me seems to be a very strong one, and I shall be much surprised if it does not succeed."

The Popularizing of Astronomy.

There is doubtless great work yet to be done in the further establishment and equipment of observatories. Astronomy would have come to little without these in the past, and its continued progress depends on the men and instruments thus located. But observatories are not engaged in the popularizing of astronomy; they are digging out the sober facts, which of course we must have, and are wrestling with the enormous problems which the science imposes upon them. They are serving themselves, a few others like themselves, a handful of students interested in sharing their work, and a few score of people who read the astronomical journals, or the popular science column of a few newspapers. It remains that the great masses of the people are uninterested in and uninformed about this supreme science.

Nor does this need to be the case. Profound as astronomy is, and unfathomable as are the depths of the sky, experience has shown that the skillful presentation of this subject to popular audiences never fails to interest, to expand the mind, to stimulate the imagination, to ennoble the character. That we can know so little about one million millions of gleaming worlds is no reason for not knowing and enjoying at least that little.

But what are the facts? Astronomy, which used to be regarded as an essential in a fairly liberal education, has now completely dropped out of the high school curriculum throughout the state of New York—so the writer is officially informed—and no doubt the same is true in most or all of the other states of the union; so of private schools for pupils of similar age. The writer has recently learned of one where 200 young ladies and girls are students, only three of whom are receiving instruction in astronomy. In the colleges, it is true, some astronomy is taught, though often indifferently, technically and mathematically, rather than phenomenally, usually in association with mathematics or some other branch of science. Distinguished professors of astronomy may be good delvers but poor teachers.

By far the larger number of high school students do not go to college anyway; a large percentage do not even finish high school. These hosts of young people go out into life knowing nothing

of any world except this little speck of dust on which they happen to be living, and indeed little enough about that. They are ignorant of what ought to be primary in their knowledge of the earth, namely, its place in the universe of worlds. They cannot tell you the difference between a star and a planet. They are amazed at the statement that the moon is not found to-night where it was last night, as an experienced teacher was to whom I spoke of it. They have no clear idea of the phenomena and causes of eclipses. They do not know one star from another, nor one constellation from another. When the subject is astronomy, they either take no part in conversation or allow themselves to be betrayed into the most egregious mis-statements. And, when they walk abroad at night, and moon and countless orbs are shedding radiance over the earth, they either do not notice at all, or else are as lost as if they were amid the labyrinth of Venetian canals. As for any thrill of healthy emotion, or uplift of soul, by reason of acquaintance with the stars, they are utter strangers to it.

* * * * *

The observatories are already splendidly equipped. What we now want is to unlock the treasures of the observatories, to let the light stream out of them that has streamed into them; to translate the great facts and figures which they have accumulated into the familiar language of the people; to make easy to the average mind what has been hard even to the trained mind; to inspire a thousand at a time with the splendor, romance and magnificence of the universe, which have again and again heaved the bosom of the lonely astronomer as he has kept his vigil at night. This can be done; on a very small scale it is being done. Its possibility and utility have been abundantly demonstrated. The next man or woman, believer in education and in general enlightenment, and lover of his less fortunate fellowmen, should make his gift, not to an already well equipped institution, but rather to the people—"Popular Astronomy."

A similar need exists in all other departments of natural science. That is the reason The Agassiz Association should be strongly supported.

An Observatory—"Per Naturam .ad Deum."

I am pleased to see that you are going to have a telescope by which you may be able to diffuse astronomical knowledge and arouse interest in the queen of sciences. Some years ago I had it demonstrated to me that only one person in thirty could explain the phases of the moon, and I doubt if we would find more than one person in one hundred that can point out a single star in the heavens and call it by name. This should not be: it is ingratitude to God who has built a wonderful universe and given man vision and intellect to see it and comprehend it. People generally believe it requires so much time and study in order to know anything about this great subject that they pass it up. It never occurs to them that it is as much man's duty to study the works of God as it is to study his words.

I have had an observatory of some kind or another here for thirty years and every now and then some one comes to the observatory, and tells me about what he saw in a former visit years ago and how he remembers what he saw. This shows that the views and impressions are lasting. There is nothing like astronomy to give one a proper conception of the Creator, for as his conception of creation grows his conception of the Creator must grow in proportion.—John A. Cook, The Cook Observatory and United States Weather Station, Macon, Missouri.

"Ox Up Lunam with the Shanghai."

Andover, Massachusetts.

To the Editor:

The account in the April number of THE GUIDE TO NATURE of the chicken house astronomical observatory recalls to mind the fact that once upon a time the fourth largest telescope in America adorned a henhouse in the back yard of a little house off what is now Massachusetts Avenue, Cambridge.

It was in 1842 or 1843 that J. D. Whitney, the geologist, his brother William, who afterwards was editor of the Century Dictionary and the author of the famous "Whitney's German Grammar," the great Latinist, George M. Lane, and two astronomers, B. A. Gould and Joseph Winlock, all then young men, took a house together, which they named "Clover Den."

We Need \$700 More

The memory of these brilliant young fellows and their housekeeping has not yet faded out of Cambridge. What interests us here, however, is that Winlock was already at work on the "Nautical Almanac," which later became his great life work, while Gould was engaged in determining longitudes for the Coast Survey. Between them, they actually managed to corral, for a short while a great telescope, the property either of their Uncle Samuel or of the Harvard Observatory, which they mounted in the unused henhouse, and by natural association of ideas christened "the Shanghai."

The biographer of one of the Whitneys confessed himself sorely puzzled by a sentence in an old letter from one brother to the other, "Now is the time to ox up Lunam with the Shanghai."

But with "Shanghai" as the key, one quickly recalls that *Luna* is Latin for the moon, and that "ox" in college slang might easily mean "work" or "study."

EDWIN TENNEY BREWSTER.

This letter is indeed most interesting, containing as it does this personal reminiscence of the two eminent astronomers, Gould and Winlock. The latter is at once suggested to all double star astronomers by his discovery of the very minute attendant to Regulus and also by his discoveries of very many other pairs which are known by his name, while the most accurate meridian work of the former at the observatory of Cordoba marks an epoch in the history of the astronomy of the southern heavens. Dr. Gould also founded the astronomical journal of perhaps the highest standard of any astronomical periodical of the world, and after its death there has been added to its title, "Founded by B. A. Gould." Many stories of his uniform consideration for younger astronomers are known to all and he may truly be said to have done fully as much as any one man ever did to advance American astronomy. I was indeed most interested in this slight contribution to a history of these eminent men.—Professor Eric Doolittle.

An Unusually Bright Halo.

Mr. Edward Pennock, of Philadelphia, has kindly sent us extended notes describing rings around the sun together with a column article from a Philadelphia newspaper. There was really nothing extraordinary about this halo except its unusual brightness. That the halo not only stirred up interest in the sun, but was in some cases even a cause for alarm, is shown by the following quotation from the paper:

"About 10 o'clock, persons who glanced up at the sky for a hint of the weather saw a broad band encircling the sun, the outer rim a deep purple and the inner a gorgeous red. In the north-western quadrant of its centre, a point in the circumference of the first circle, was a second band of whitish hue, greater in size but much less distinct than the other. In addition there appeared in the southeast quadrant of the primary band a segment of about 90 degrees, still less distinct, although the red and violet of its edges were discernible. The first had a 22 degree radius and the second one of 44 degrees.

"For two hours and more this strange sight met the gaze of millions, for it was visible in the greater part of Eastern Pennsylvania, New Jersey and Delaware.

"By noon all Philadelphia and virtually the rest of the territory concerned went out of doors and stood on tiptoe watching the strange sight. Knots of persons would point their fingers at the halo and assure themselves that it was a 'war ring' or that it signified the end of the world.

"'Old timers' remembered that a similar apparition had appeared just before the Civil War; others versed in biblical literature compared it with the rainbow that cheered the hearts of Noah and his crew on the Ark, or quoted from Revelations on the end of the world.

"In the Italian section of the city and in Italian settlements in rural communities where the rings were observed the terror in some cases nearly assumed the proportions of a panic. It was held by them to be a bad omen for Italy's entrance into the war."

This article and other inquiries were referred to our Professor Doolittle and he replies as follows:

"The brilliant haloes described by Mr.

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Pennock naturally created a great deal of interest here in Philadelphia, and even a good deal of excitement among uninformed persons who regarded them as 'signs in the heavens' of some evil or good to come. I suppose that practically everyone in and around the city saw them: we received perhaps sixty telephone calls regarding them between the hours of 10:30 and 12:, when they were most conspicuous.

"Of course we carefully observed them. My assistant here saw not only the three bright ones, but also at least four more—the outward, so-called parhelic circles, but sun dogs seemed not this time in evidence.

"Now this is a well-known and not at all an *unusual* phenomenon, though it is very unusual to see the circles so bright. I could explain it fully, but I think this not necessary as the explanation will be found in any meteorology; for example, Loomis, pp. 214 to 225, is very clear and good and illustrated by many figures. Mr. Bliss (our weather man) tells us that these average about two hundred eight a year. (This means sun and moon haloes both). When making the noon observations of the sun, we very frequently see them if the sky is hazy but otherwise clear, but, as I said, the usual halo is far *fainter* than that seen the other day and so attracts no particular attention. I have coated a pane of glass with alum crystals and so can now show my students a set of three fine haloes whenever I wish to do so."

The Tints of Spring.

The tints of spring are rainbow tints,
All roseate and gay;
Aladdin's lamp to bear us all
To fairyland away.

The mists of green, the gauzy scarfs
Thrown o'er the branches bare,
Are all in keeping with the warmth
And softness of the air.

The trees a-shimmer and a-flower,
Are robed like reigning queen;
They're regal, ere they settle down
To summer's constant green.

Then come into the open, come,
Renew your own youth too;
The show is fleeting, all too soon
The pageant will be through.

—Emma Peirce.

The Starry Heavens in July.

BY PROF. ERIC DOOLITTLE OF THE UNIVERSITY OF PENNSYLVANIA.

OF all the seven planets, there is not one whose in the heavens now brings it within the limits of our evening star map; this is the only month of the year in which this unusual condition is presented. The observer who wishes to see at one time as many as possible of the bright worlds which circle about the sun, must now go out in the morning, an hour or less before sunrise. Then he will see the great Jupiter shining in the southwest, Mars high in the heavens in the southeast, and Venus and Mercury close to the ground in the east, both so nearly lost in the sun's rays, that they can be viewed for a few minutes, only, in the early dawn. The planet-less condition of the evening heavens will last, however, for but this single month. On July 31st, Jupiter will rise but 17 minutes later than 9 o'clock, and for the rest of the year this beautiful world will shine out brightly in our southern skies.

The July Stars.

There is no part of the heavens which is more beautiful or more filled with objects of interest than the southern and southeastern sky of this month. First, is the brilliant Scorpio, with its red Antares; to the right of this there will at once be seen the two stars of the Balances and the bright, bluish Spica, while, so high above that they are now almost in the zenith, is that bright and interesting train of five striking groups which is led by Bootes and ended by the Northern Cross.

All of these groups the observer will have but little difficulty in tracing out, but the stars of the great area extending almost from Arcturus to Sagittarius and from Hercules to Scorpio are far less conspicuous. These form the Serpent and the Serpent-holder. The former is a long, winding constellation whose head is the interesting groups of some 15 or 20 stars at A, Figure 1, and whose swinging body extends first downward and then upward along the exact center of the Milky Way, until the tip of the tail is reached. The Serpent-holder is represented as an old man whose head is at E and whose feet are at F, and who holds the writhing Serpent in his two hands at the pairs of stars, B and C.

There is a special pleasure in tracing out and becoming familiar with these

faint groups, and often their outlines are more perfect and there are more objects of interest within their boundaries than is the case with the few, very brilliant, constellations, with which nearly everyone is familiar. But to study these more hidden beauties of the heavens the observer must be sure to select a dark night, when the moon is absent, and to go away from the city or other artificial lights; it is only then that the wonderful beauty and infinite complexity of the heavens will appear to him.

The whole Summer Branch of the Milky Way is now well up from the

of their enormous distance from us, that they appear merely as filmy patches of light in a small telescope.

The Comets Now in the Heavens.

The first comet of the present year has been approaching the earth and sun so rapidly that it will be just visible to the eye throughout the present month. Unfortunately, however, its motion carries it so very far below the celestial equator that during this, its time of greatest brightness, it is wholly invisible to northern observers. At the beginning of July it is, in fact, very close to the South Pole



FIGURE 1. The Constellations at 9 P. M., July 1. (If facing South hold the map upright. If facing east hold East below. If facing west hold West below. If facing north hold the map inverted.)

ground and this will repay many hours of exploration with a small telescope. Its wide southern portion is remarkably filled with star clouds and streams, alternating with vacant regions from which the suns seem to have been swept away to be heaped together elsewhere. This whole region, and especially the lower part of Ophiuchus is remarkable for the great number of round, compact star clusters which it contains; but these are nearly all so faint, probably on account

of the heavens. From here it will move rapidly northward, traversing the whole length of the constellation Eridanus, and finally crossing the celestial equator and entering the borders of Taurus in next January. It will be in reasonably good position for northern observation next November, but by that time it will have diminished to the 9th magnitude, and will continue to grow steadily fainter.

This comet is one of those, which,

being originally little nebulous clouds, far out in space, came to feel the gravitational pull of our sun and to fall toward that body. Since both the cloud and our sun are rushing through space, the chance of an actual collision occurring is almost infinitely small; the comet will, in fact, miss the sun but swing around

then whenever we have a shower of shooting stars it is because our earth ploughs through a great stream of meteoric particles which were formerly gathered more closely together into the cloud form which we call a comet.

The further behavior of this new body as it approaches the sun will be watched

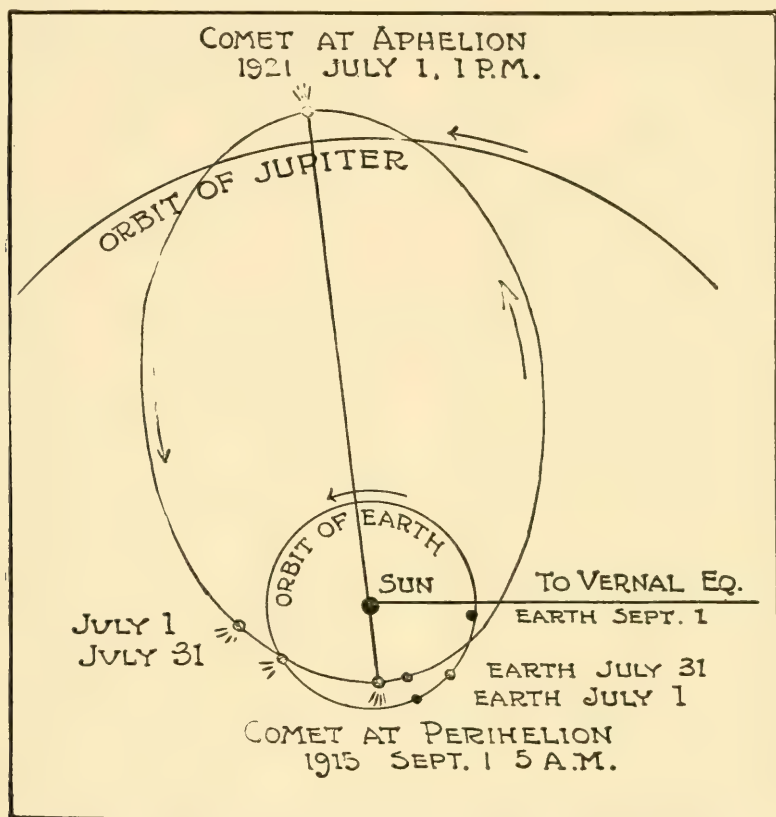


FIGURE 2. The path of the faint periodic comet, 1915 b, about the sun.

that body, and if undisturbed by the pull of any of the planets, will recede into space, never to be seen by us again.

The present comet will attain its nearest approach to the sun on July 18. The most interesting observation connected with it thus far is the discovery that during May its mass disrupted, probably under the tidal and electrical forces of the sun toward which it is falling, and that four masses broke away from the main head and are now receding from this at the rate of about 2,000 miles a day. It is believed that it is from comets which are thus broken up and whose substance is distributed for a great distance along their paths, that no shooting star-streams are formed. If this is so,

with great interest. It is indeed unfortunate that just at this critical time it will not be visible from our northern observatories.

Another most interesting comet was re-discovered in April. This body upon its first approach to the sun was disturbed in its motion by Jupiter and so forced to follow the closed path shown in Figure 2. It passes completely around this orbit in 5 years 10 months; its last return was in 1909, and it has appeared altogether six times since its first discovery. As the path of this body is so accurately known, its apparent position among the stars can be computed for any time with great accuracy. It was searched for this year by means of a delicate

photographic plate and when it finally had approached near enough to impress its image upon this plate it was found to be in practically the exact position which was predicted. This comet will remain in our northern heavens throughout the month, moving along the path M N Fig-

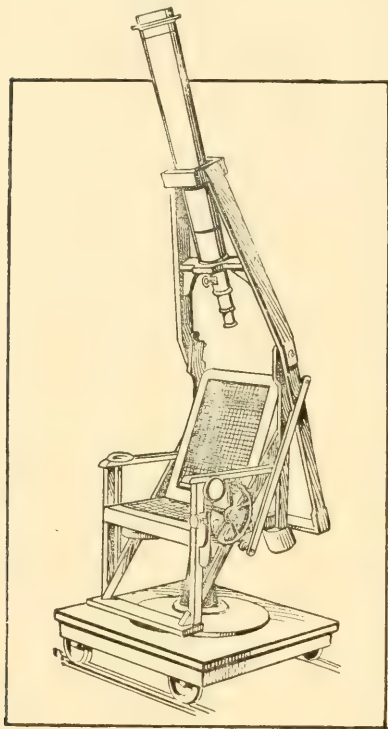


FIG. 3. "THE COMET SEEKER."

A form of small telescope with which the observer sweeps over the sky, hour after hour, and night after night, in the hope of discovering a new comet.

ure 1, but it will remain a very faint object. It will pass nearest the sun on September 1.

A third, very faint, periodic comet was discovered in May, in the constellation Pisces, so that altogether there are three comets now visible in the sky.

The Planets in July.

Mercury, which came to conjunction on June 26, will reach its greatest distance west of the sun on July 18 and may then be seen in the early morning sky for one and one half hours before sunrise.

Venus also rises one and one half hours before sunrise on July 1, but this time is diminished to 40 minutes by July 31. This planet is rapidly becoming lost in the sun's rays and will be practically invisible after the middle of the month.

Mars is in Taurus, between the Pleiades and the Hyades. It rises 3 hours

before the sun on July 1 and this time is increased to 3 hrs. 35 min. By July 31. This planet is drawing steadily nearer the earth and now shines in the morning sky with the brightness of a first magnitude star.

Jupiter is conspicuous in the southeast after midnight. It rises at 11 hrs. 20 min. P.M. on July 1, and at 9 hrs. on July 31.

Saturn entered the morning sky on June 28 and throughout the month remains too near the sun to be observed.

On July 5 at 4 P.M. our earth reaches its greatest distance from the sun of the present year. At this time we will be 3,112,100 miles farther away from the sun than we were at the time of our nearest approach on the 2nd of last January.

It is related of Sir Isaac Newton that he was once attracted by a fair lady, and paid court to her; in the course of an evening's visit he fell to musing. Reaching out his hand he took the young lady's and raised it gently toward his lips; he carefully picked out the little finger on which to bestow the evidence of his affection. About this time the lady also became lost in pleasant thoughts. Sir Isaac squeezed her finger a bit, and stirred the hot ashes of his pipe with it. The rest of the story is short; he remained a bachelor.—Howe's "A Study of the Sky."

The condor of the Andes Mountains, the largest of all flying birds, takes seven years to grow up. The birds spend an entire year in the nest before learning to fly. After that, they remain for two years more under their parents' care. Not until they enter their seventh year, do they take on completely their adult plumage.

BY-WAYS.

Lightly tripping, Summer comes,
Clad in verdant coat;
The weary world the open seeks,
In motor, and in boat.

But through the highways; and the fact
Is known to you and me,
That nature's byways are the best,
With stores of wealth to see.

While others hasten, we will stroll,
And find, in every nook,
Enough of interest and charm
To fill a Wonder-Book.

—Emma Peirce.



What The Agassiz Association Offers.

IN GENERAL.

From the Charter of Incorporation: "The purposes for which said corporation is formed are the following, to wit: the promotion of scientific education; the advancement of science; the collection in museums of natural and scientific specimens; the employment of observers and teachers in the different departments of science, and the general diffusion of knowledge."

The Agassiz Association is a Clearing House for information on any phase of nature or of natural science. It places at your convenience the total of all human knowledge pertaining to the natural world. This it is able to do by having a Council of experts in every department of natural science. If anybody knows it, you may know it by merely inquiring.

The AA publishes observations, answers questions, identifies specimens and creates and increases a knowledge and love of nature. This work is not limited to its Chapters and Members. THE GUIDE TO NATURE, the official organ of the Association, is devoted to commonplace nature with uncommon interest.

LOCALLY.

ARCADIA offers to Stamford, Sound Beach and Greenwich, and to visiting parties from other places, the facilities of a general natural history Institution:

The beautiful Agassiz Grove.

A well-equipped Reception Room.

Nymphalia. This is a nature study park, so named because it is the home of Nymphs of nature study: Love, Study, Interest, Enthusiasm, Beauty. Begin with Love and through the series we find Beauty. "We love things not because they are beautiful, but they are beautiful because we love them."

The Forest of Arden—more than one hundred acres of unexcelled picturesque wild forest and thickets, explained and explored under personal guidance.

Demonstrations in an up-to-date apary.

Instructions in a biological laboratory.

Exhibitions with compound and projection microscope not equalled anywhere else in the United States.

Soon to be in readiness, it is hoped, an astronomical observatory with a six-inch telescope. This telescope will probably be the only one dedicated wholly to the free use of the public for the study of the heavens.

What Our Expenses Have Been.

In the year ending March 31, 1915, our expenditures were a total of \$6,046.97. Deducting Sundays and holidays this is an average of \$19.95 per day.

The President of The Agassiz Association receives no salary for work as President nor as editor of THE GUIDE TO NATURE. For some of the mechanical and business work on the magazine he has received this past year \$708.44 or \$13.62 per week. For the previous seven years he received not a cent of pay even for this kind of work. Three members of the family who assist (some giving their entire time) have received no salary. The Bigelow family does not receive even free house rent. Birchen Bower and its part of ARCADIA freely used by the public is *not* the property of The Agassiz Association. The family pays the AA a rental for personal use of the garden and the pet house. It will be seen that so far as the Bigelows are concerned, they give their time to the Cause to which the public is giving financial support.

These services have been unpaid because there has not been sufficient income with which to pay for them. Additional workers will be secured when the income is sufficient. The equipment could use to advantage many times the present number of workers. There is no limit to the general work; the local work too, is pressing for an increased number of assistants.

Our Income.

1. Membership Fees. You are eligible for membership if you approve of the work as here outlined. Full particulars upon application.

2. Subscriptions and Advertisements. *THE GUIDE TO NATURE* is growing. It now has a circulation of three thousand. Help it grow. You may thus extend and aid our work.

3. Cash Contributions. These have come from all parts of the world and have been an important factor in sustaining the work.

4. Rentals of Parts of *ARCADIA*. From the Bigelow family for garden and pet house. From Mrs. Blakely for the site for her Botany Bungalow. She owns her house, pays rental for land, her membership dues, and *gives* her services freely to the botanical students of the AA.

Inspection and Cooperation.

The cashbooks for any year may be inspected by any Member or Contributor. Every detail of the work will be made clear to any one that wants to know. We need more money and have full confidence that with increased knowledge by our Members and friends and by the public in general as to the exact situation, it will be freely given.

Here is a work of merit that in which the interests of humanity should be properly financed for full efficiency. Nowhere else in all the world has so much been accomplished in forty years with so little money; nowhere has there been greater faithfulness, or more devoted service, or a greater ideal for the uplift, the education, the improvement of humanity.

EDWARD F. BIGELOW, President,
The Agassiz Association, Inc.,
ARCADIA, Sound Beach, Conn.

The Agassiz Association and Its Arcadia Are for You.

'To create and increase a knowledge and love of nature. You are not too rich, nor too poor; not too wise nor too ignorant; not too young nor too old, to share in their benefits.

VISITING DAYS.

To Members (and accompanying Friends). All Days. Special personal attention, if an appointment is made by telephone or otherwise.

To Non-Members (not accompanying Members). Wednesdays and Saturdays, 3:00 to 5:00 P. M., and at other times

by Special Invitation and Appointment.

The Agassiz Association's Home (*ARCADIA*) is for Study and Research, and for the Giving of Information upon any phase of nature to any person that desires to know. It is also intended to create a desire to know.

It is a Clearing House for an interchange of observations by its Council and Members.

It is not a Museum, not a Botanical Garden, not a Zoo.

Yet at different times it has a few special interests (under special study) along some or all of these lines. Our purpose is not so much to exhibit nor to entertain, as to create a desire to do what Agassiz so insisted upon—that is, to "STUDY NATURE," and to aid in that study.

YEARLY CASH REPORT.

Approved at the Annual Meeting on May 28th
1915

SUMMARY—CASH RECEIVED

From <i>THE GUIDE TO NATURE</i>	- - -	\$4,648.56
From Members' Dues, Contributions, etc	- - - - -	1,398.41
Total		\$6,046.97

SUMMARY—CASH PAID

For <i>THE GUIDE TO NATURE</i>	- - -	\$4,972.20
For General Expenses and Improve- ments	- - - - -	1,074.77
Total		\$6,046.97

The above is a correct summary of cash received and paid from April 1, 1914, to March 31, 1915, inclusive.

(Signed) Edward F. Bigelow.

Subscribed and sworn to before me this 23rd day of April, 1915.

(Signed) Harry C. Frost
(Sound Beach, Conn.) Notary Public.

* * * * *

This is to certify that I have examined the details of which the foregoing is a summary and find all to be correct.

(Signed) Clinton R. Fisher
(Stamford, Conn.) Auditor for the Public.

Subscribed and sworn to before me this 11th day of May, 1915.

(Signed) Clarence E. Thompson
(Stamford, Conn.) Notary Public

* * * * *

I have gone over the detailed cash account of the A A and *GUIDE TO NATURE* for the year ending March 31, 1915, and find them correct, as stated, and am satisfied that the expenditures have been made wisely.

(Signed) Hiram E. Deats,
(Flemington, N. J.) Auditor for Trustees.
May 28, 1915

For Real Study.

Signs have been put in the northern part of ARCADIA which read "NYMPH-ALIA, a part of ARCADIA, for nature study. If you wish to enter, call at the office for permission. The Agassiz Association."

These notices are not to exclude any visitors who wish to study nature but are to exclude those who are not seriously interested in knowledge rather than injury or pernicious idleness. A cordial invitation is given to everybody to study nature in any part of ARCADIA, but young folks or others should understand that while it is kept wild, every inch is under

tone illustrations and lantern slides of the eminent scientist from whom the Association takes its name, but this is the first large framed portrait and therefore is a most welcome gift.

Reports come from trappers in northern Maine that a feral race of the domestic cat is appearing in the region. The creatures are apparently the descendants of pets deserted by summer visitors which have managed to survive the winter. Now they are several generations removed from civilization and have completely reverted to the wild condition.



THE SULPHUR "MUSHROOM" (FUNGUS)

careful protection. A guide will be furnished at the office for any one who wishes to really study nature.

Framed Portrait of Agassiz.

Mrs. William Siegrist Sound Beach, Connecticut, has presented to the Agassiz Association a large and beautifully framed portrait of Louis Agassiz to be placed in the Welcome Reception Room. This is the first portrait of Louis Agassiz, strange to say, that has been placed in ARCADIA. There have been in use for some time small photographs, half-

A Beautiful Fungus.

Salem, Ohio.

To the Editor:—

Enclosed you will find a photograph of one of our most beautifully colored fungi—the sulphur mushroom. This one was of fairly large size.

The sulphur mushroom, *Polyporus sulphureus*, is indeed a beautiful object; its delicate lemon yellow body with an orange border makes it a handsome fungus, although this applies only to the fresh state, for it soon crumbles into an unsightly, soft and ill-smelling powder.

H. W. WEISGERBER.

Celebrating "Bird Day" in New Orleans.

BY STANLEY CLISBY ARTHUR, NEW ORLEANS, LOUISIANA.

The state of Louisiana observed "Bird Day" this year on May 4th, the anniversary of the birth of John James Audubon, who was a native of that state. Appropriate exercises were held in all of the public schools of the state and the pupils were told of the great naturalist's life work, and special plans

Louisiana forest scene by the use of actual trees, shrubs, palmetto leaves and hanging Spanish moss. The mounted birds were installed by the ornithologist of the Commission, Stanley Clisby Arthur.

The city displayed the liveliest interest in the exhibit. Through the use of a counting machine it was learned that over fifty thousand people visited the display between 6 a.m. and 6 p.m. Monday, May 3rd., and were about the four-



THE BIRD DAY EXHIBIT IN NEW ORLEANS.

were made for the preservation of the birds.

In New Orleans the feature of the bird day observance was a comprehensive display of the different birds of the state by the Conservation Commission of Louisiana. Over two hundred and fifty mounted specimens of the bird life of the state were mounted in realistic attitudes by expert taxidermists. The largest department store in New Orleans donated to the display a large center show window, measuring eighteen by thirty-three feet, and the whole was converted into a typical

sided window six deep that evening. As all of the birds and the half-dozen mammals shown were designated by cards having the common names, the fact that they were either resident, winter visitors, or migratory, the whole display was made educational. Game birds were designated as such, and the few "outlawed" birds were so labeled, and special attention was called to the value of the song and insectivorous "citizens of the air."

On May 4th, many thousands of public school children attended the exhibit in class bodies, and their teachers

explained the various reasons for bird and other wild life conservation. The Conservation Commission on this day distributed copies of the Bird-day Bulletin to the children together with Audubon Society leaflets. The newspapers of the city gave great publicity to the display and the department store inserted half-page advertisements in the press calling attention to the exhibit. The success of this display has been so marked that President M. L. Alexander of the Conservation Commission is arranging for a display of the same kind four times a year and will also send one on a tour of the state. The interest this exhibit has aroused will result, it has been predicted, in a better observance of the laws of the state in reference to wild life.

The Mysteries of Flowers.

Mr. Herbert W. Faulkner of Washington, Connecticut, has revived this famous lecture.

The name, William Hamilton Gibson, will recall to nature students throughout our country the splendid work of that distinguished writer, artist and naturalist, whose lectures on the wild flowers possessed such rare merit and charm. For these lectures Mr. Gibson invented and made many different sets of gigantic moving charts—all colored by hands and true to nature. These charts showed bees and butterflies in the act of visiting the flowers, and by a mechanism that worked like a charm the models gradually changed and displayed the subtle operations of the plant and insect worlds. In this ingenious way, to the keen delight and edification of his hearers, he demonstrated nature's wonderful scheme for the perpetuation of plant life.

These charts have lain idle since the untimely death of Mr. Gibson, while a new generation of nature lovers has grown up who would be charmed by the remarkable revelations of these unique models.

The name, William Hamilton Gibson, is well-known to nature lovers. Mr. Faulkner has for several years occupied Mr. Gibson's studio at Washington, Connecticut, and has had the opportunity to make a careful study of his specimens, writings, drawings and lecture notes.

A circular giving full particulars of

these remarkable lectures and Mr. Faulkner's treatment of them will be mailed to any one upon application to Herbert W. Faulkner, Ph. B., D. E., Washington, Connecticut. Every nature lover will be pleased to know that these lectures will be available to the present generation. No writer nor lecturer ever succeeded better in inspiring a real love and a real desire to know nature than did Mr. Gibson. The younger generation knows but little of him except through the charm of his books, "Sharp Eyes," "My Studio Neighbors," "Eye Spy," and others. These lectures will revive, as far as possible, the wonderful charts and models.

Goat Eats Tobacco and Bag.

Summerland, British Columbia,
Canada.

To the Editor:

IN THE GUIDE TO NATURE for April, I read two interesting "lessons" on the goat. I should like to add a third. A goat owned by my friend, Professor J—, decided to make me a morning call. Skipping across the yard she stopped to gaze, also to graze, on the strawberry bed. In a short time that strawberry bed was a minus quantity. Seeing a white object lying near a tree she investigated that. It was a cotton flour sack containing ten pounds of twist tobacco. She ate nearly all the tobacco and part of the sack; on a second visit she finished the tobacco and left only a few shreds of the sack.

Sincerely yours,

MRS. EVA C. VAN HISE.

Mr. D. M. Barringer, in the Proceedings of the Philadelphia Academy for September argues that the so-called "Meteor Crater" in Arizona, was actually formed by the impact of a meteor, probably a portion of the head of a small comet.

A contribution to natural history comes to hand in a post-card photograph of a "two-mile auto bridge over Little Egg Harbor Bay," the roadway of which is for a long distance strewn with broken clam-shells. The post-card naturalist says: "The white things you see are clam-shells. The sea-gulls get clams from the flats and fly up high and drop them to break the shells so they can eat the clams. The bridge-tender has to sweep them off every day, they cut the tires so." —The Outlook.



EDITORIAL



Good Wishes for an Accomplished Editor.

Norman Talcott has resigned the editorship of "The Greenwich Press" which he established some five years ago. In his work he has been ably assisted by Mrs. Talcott, who, like himself, is a skilled writer.

Mr. Talcott is above the average as an editorial writer. He has pronounced convictions, and states those convictions so clearly and effectively as to convince every reader of his thorough sincerity even if he does not always convert the reader to his belief. He has a peculiarly artistic temperament and the manner in which he has struggled against enormous obstacles in his effort to accomplish his ideals should inspire anyone who is struggling to achieve some permanent good. There is no confusion in his thought. From his point of view he sees his ideals and the needs of the community with remarkable clearness. There may be those who do not think that he always has the correct point of view, but any editor or any other person who struggles to accomplish things is liable to that little criticism. Mr. Talcott's resignation brings real pain to his fellow writers of Greenwich and to his many readers. These have stood by him with a loyalty that could never have been inspired by one not possessed of his strength and his artistic skill in presenting ideas. *THE GUIDE TO NATURE* extends to him the most cordial wishes in whatever line of work he may in the future undertake.

Promulgating the Busy and Beautiful.

The Stamford Board of Trade has issued a remarkably beautiful "Year Book" to tell of our busy and beautiful city, its location, scenery, history, government, industries, resources, statistics and growth. The work is highly creditable to those who have had it in charge. It is well done. It is the kind of book that has been needed for a long time. From the natu-

ralist's point of view we are delighted with it. Its descriptions and pictures of our outdoor interests are charming and alluring: moonlight at Shippan Point, an artistic gem by Brown & Dawson; an enticing view of the Long Ridge road and various others near Stamford; rural life in haying time; picturesque scenery on the Wire Mill road, and numbers of other beautiful views. Together they make this a delightful handbook. Some of Brown & Dawson's work is far above the ordinary standard of similar photographs. We feel proud when we note how this "busy and beautiful" city is growing and how well it is "doing things."

From the viewpoint of nature there is probably no city in all the world that can equal Stamford. Here are farms under intensive culture, seashore, wild country, picturesque ravines, marvelous landscapes, and unlimited natural resources. Many of the suburban roads are in splendid condition and others are being gradually brought to the highest standard. In our opinion this part of Fairfield County is the best place in all the world. We congratulate the Stamford Board of Trade upon its success in so effectively unfolding the activities and the beauties of this beautiful and active town.

One promising experiment in cattle breeding, now being carried on at the University of Wisconsin Experiment Station and also on a private estate in the north of England, is the attempt to toughen the Jersey strain by crossing it with the hardy Angus or Aberdeen-Angus stock. The result, thus far, is an animal, hornless like the Angus, or with mere short loose scurs, somewhat more beefy than the Jersey, but an almost equally good milker. The striking thing about the new breed is its toughness, the young stock actually thriving better through the winter in open sheds than in the warm stables of the dairy breeds.



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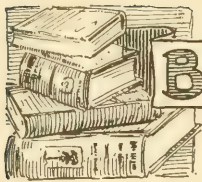
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HOW TO USE NEW THOUGHT IN HOME LIFE.

By Elizabeth Towne. Holyoke, Mass.: The Elizabeth Towne Company.

Mrs. Towne has here answered almost every conceivable question relating to the home life, to the problems of husbands, wives and children. She shows how to apply New Thought in the home to promote happy and efficient living, to make the home a successful and happy cooperative colony versus an individualistic hades.

ILLUSTRATIONS OF A THOUSAND SHELLS. Part

II. By Y. Hirase, Karasumaru, Kyoto, Japan.

Part I of this interesting series has already been reviewed in this magazine. Those of our readers who were interested in that will be glad to know that the second part has been issued. The book is beautifully bound in silk and is made to open in an unique way as a continuous strip of paper. The illustrations are peculiar to Japanese art, and are beautiful. The price of the book is \$1.50 postpaid.

WAR AND WORLD GOVERNMENT. By Frank Crane, D. D. New York: John Lane Co.

Rarely has any one man exerted so wide an influence upon the thought of the people as has Dr. Frank Crane. His ideas are constructive, progressive, yet sane. He has something to say, and he says it in the simplest possible way. His editorial utterances on the subject of war have been published in many leading newspapers of the United States and Canada, and are here gathered in a volume. The keynote to all is an appeal for international influence which, the talented writer claims, is the only way in which to abolish war's horrors.

THE WHOLE YEAR ROUND. By Dallas Lone Sharpe. Boston: Houghton Mifflin Company.

This book is designed especially for children, and by experience the author knows whereof he writes, for he says that when he was a child he roamed the fields as he still does with all the child's love of freedom and all his joy in the companionship of wild things. For these things he is asking the children of the present day to tramp the fields. He himself is still a child at heart and he still loves the ways of wild folk. He rightly says that ordinary things are ordinary only because we have not watched them nor thought about them. The method of going should be "bare-foot when we can, in rubber boots if we must; sometimes with a fish-pole, sometimes with a hoe; sometimes with a camera—but never with a gun; and if we see nothing more than the sky and the earth, we shall not have had our tramp in vain—not if the sky is full of clouds or storm or stars; and not if the earth is full of wideness and freshness and freedom; and not if our hearts are full of—it may be, of those strange deep feelings that the hearts of children know."

ATLAS DESIGNED TO ILLUSTRATE BURRITT'S GEOGRAPHY OF THE HEAVENS. By Hiram Mattison, A. M. A new edition, revised and corrected. New York: American Book Company.

This department is intended for notices of new books. It is an unusual experience for the reviewer to be called on to speak of a work originally published several years before he was born. He well remembers this as a book of his earliest boyhood. He was then delighted with the outlines of the mythological animals and other fancies that live in the sky. The heavens in this book and the book itself perpetually renew their youth and charm. This atlas gave joy to fathers and grandfathers and to boys and girls of more than a half century ago, and yet here it is to-day, revised, corrected and ready to tell of the ancient shepherds' queer astronomical fancies. Every amateur astronomer should have the book; others who get it will become amateur astronomers.

THE LURE OF THE LAND. By Harvey W. Wiley, M. D. New York: The Century Company.

Dr. Wiley is known everywhere for his discussion of the pure food laws. He has written an ideal book in which he considers both the advantages and the disadvantages of leaving the city for the country. He says:

"From my point of view I would set forth for the average man of average means, who wishes to indulge the natural desire for country life, the dangers and difficulties, as well as the advantages and successes, of making his home on the farm.

"It is evident that those who live in the country must earn a living, but in doing this there is no need that all of the beauties of rural life should be sacrificed until it becomes a burden unbearable. It is not difficult to understand how the youth brought up on a farm turns his longing eyes towards the town. The conditions of farm life, as a rule, are not such as to attract or to hold the farmer's son or daughter. Life does not consist alone in watching the beautiful sunrise, in strolling through a shady forest, or wandering by a babbling brook. To the farmer's boy life means early rising, hard and continuous labor, plain and often poorly cooked food, hard beds, and an absence of all the opportunities which the youth so strongly desires. It is just as natural for the farmer's boy to look towards the town as it is for the town boy to look towards the country, but these conflicting desires arise from different sources."

The last sentence raises a question. I wonder how many town boys do look longingly toward the country. I wish someone could tell us that, and just how we may aid those boys. In what are they interested and how may that interest be developed into real knowledge and love of the country?

The Guide To Nature

To Know The Starry Heavens

(SEE PAGE 94)

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Vol. VIII
No. 3

August 1915

EDWARD F. BIGELOW
MANAGING EDITOR

Subscriptions, \$1.00 a Year. Single Copies, 10 Cents

GREENWICH

THE EDITION DE LUXE
OF CONNECTICUT TOWNS

GREENWICH

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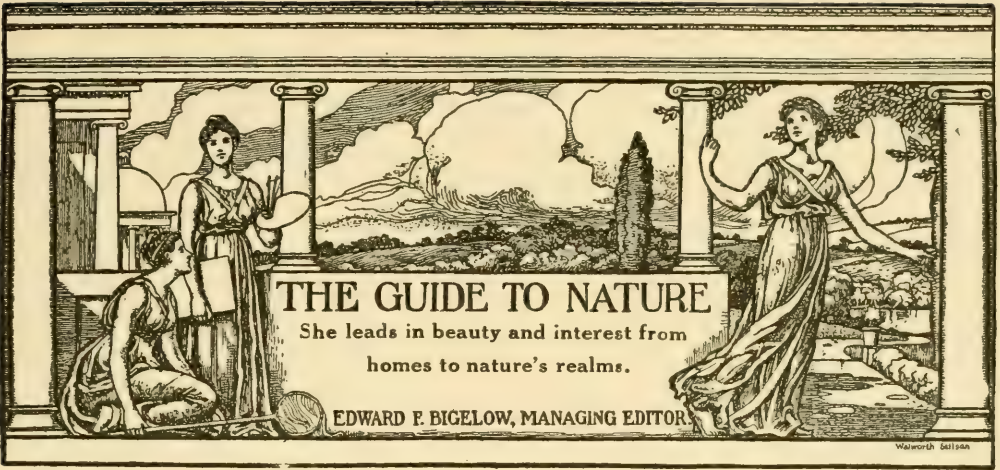
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Volume VIII

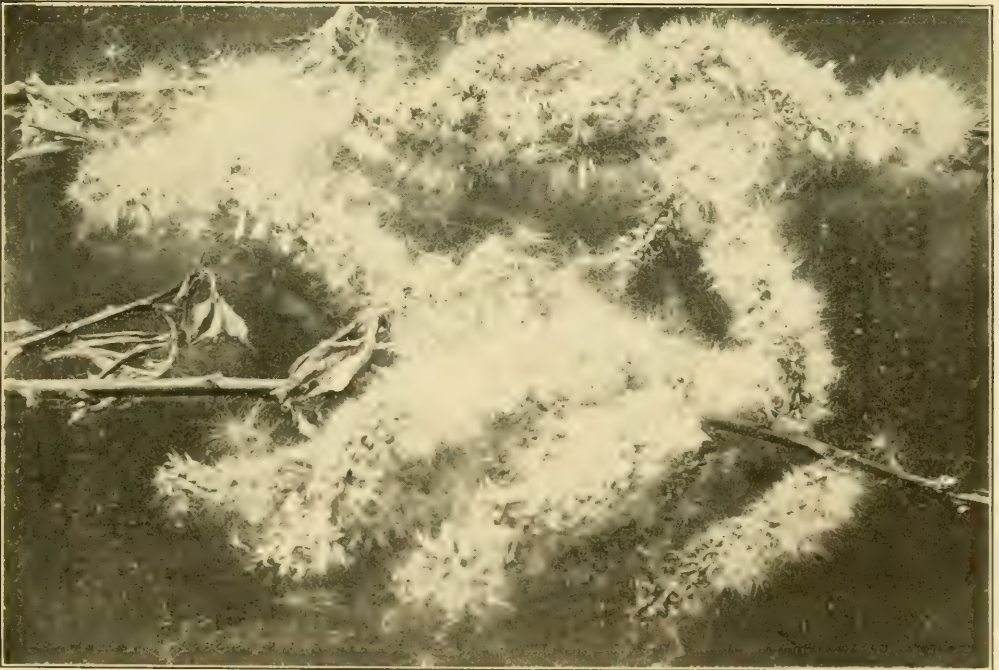
AUGUST.

Number 3

The Pussy Willow's Neglected Beauty.

If the pussy willow could speak, it would stand up in every springtime marsh and say, "You love and admire me not for my intrinsic beauty, but for what I represent in the transition of the seasons. If I should come in midsummer you would not notice me. In June I

come in greater beauty than almost any other plant. In June I come from the autumnal point of view with as startling an interest as in the last of winter I come with suggestions of spring. If in the early spring I spoke with a portent of the charms of spring, then why do you not, nature lovers, for the same



THE PUSSY WILLOW PREPARING FOR THE "REVELRY."
 (See next page.)



THE REVELRY OF THE FULLNESS OF LIFE OF THE PUSSY WILLOW IN JUNE AND JULY.

reason admire me in June when I give you a premonition of the fulness of October joys? You have forgotten that I shared in the spring because you will not remember me now. Perhaps I have too many rivals but you will, in September or October, go into ecstasies over the fruit of the milkweed, and even later for

the joys of fruiting goldenrod, hawkweed and innumerable members of my faithful kin."

Thus may the pussy willow complain because no other plant receives admiration more transient and as wrong as it is transient. The pussy willow in June is

the most dainty and delicate of fruiting plants. But what a parody of human nature it is! How frequently it occurs in life, in good fortune, in happy partnerships, how frequently do we forget those that gave the introduction that has completely changed the course of our life, or how often do we forget the kindness that changed our path and led us toward subsequent prosperity.

Let us not forget the pussy willow that stands at the gate of June and welcomes us to the joys of summer.

The Peanut.

BY DR. FRANK CRANE.

(Copyright, 1914, by Frank Crane. Published by courtesy of "The Globe," New York City.)

I would lay a few wreaths at the feet of the peanut.

It is one of the admirable arrangements of whoever runs mundane matters that the very best goods of life are for every man, and that the proud and privileged when they nibble their expensive delicacies are toying with the avenging furies, from a pain in their tum-tums to hardening of the arteries.

There is air, for instance, oodles of it, free; and if there be aught better I have never found it. Also water. Also sunshine.

More expensive, but still cheap enough for dollar-a-day folk, is corn bread, the thanwhichest of all toothsome things.

Right down below the high-cost-of-living list, down where the multitude mults, even below down where the Wurzburger flows, are the little friends of the hoi polloi, the peanuts.

Item. They are good. A better nut has not been nussed. If they cost twenty-five cents apiece they would be served as hors d'œuvres at the Grand Hotel de Luxe, and make glad the small white teeth of the daughters of Millionbucks.

If they cost \$100 a nut their shells would be strung around the necks of the grillionaires' ladies who unveil their beauty upon us the first night of the opera.

Alas! They are five cents a bag. So they are nothing but just plain good.

Item! They are nourishing. Fad-dists and medicine men have denounced all other kinds of food, white bread,

sugar, coffee and milk, but none has dared to lift his voice against the peanut.

A sack of peanuts is an excellent lunch. I so lunched yesterday. I bought a nickel's worth of Dante Alighifferi, who keeps them hot at our corner. I ate them for three blocks. It is a grand thing to lunch walking; you get your air, exercise, and nutrition all at once.

They are still better eaten between meals. They are the ideal tid-bit for those who watch the baseball game. They are the right hand of the circus man. On trains they have no fellow, when there is no dining car and no stop for dinner.

They are the true symbol of democracy.

They are friends of lovers. Who can say how subtle are the opportunities of the paper of peanuts consumed by "me and Mame" up in the third balcony, when our hands touch as we fish the gay goobers from the sack, and munch while we watch Lord Edward being foiled upon the stage?

"The Star Spangled Banner" may be the national tune, the golden rod or something else the national flower, and the turkey and the eagle the national birds, but the national nut is unquestionably the peanut.

Sweet is the voice of the peanut man as he sings: "Five cents, a nickel, half a dime. All ready and all hot. Right this way, ladies and gents, for your fresh roasted peanuts!"

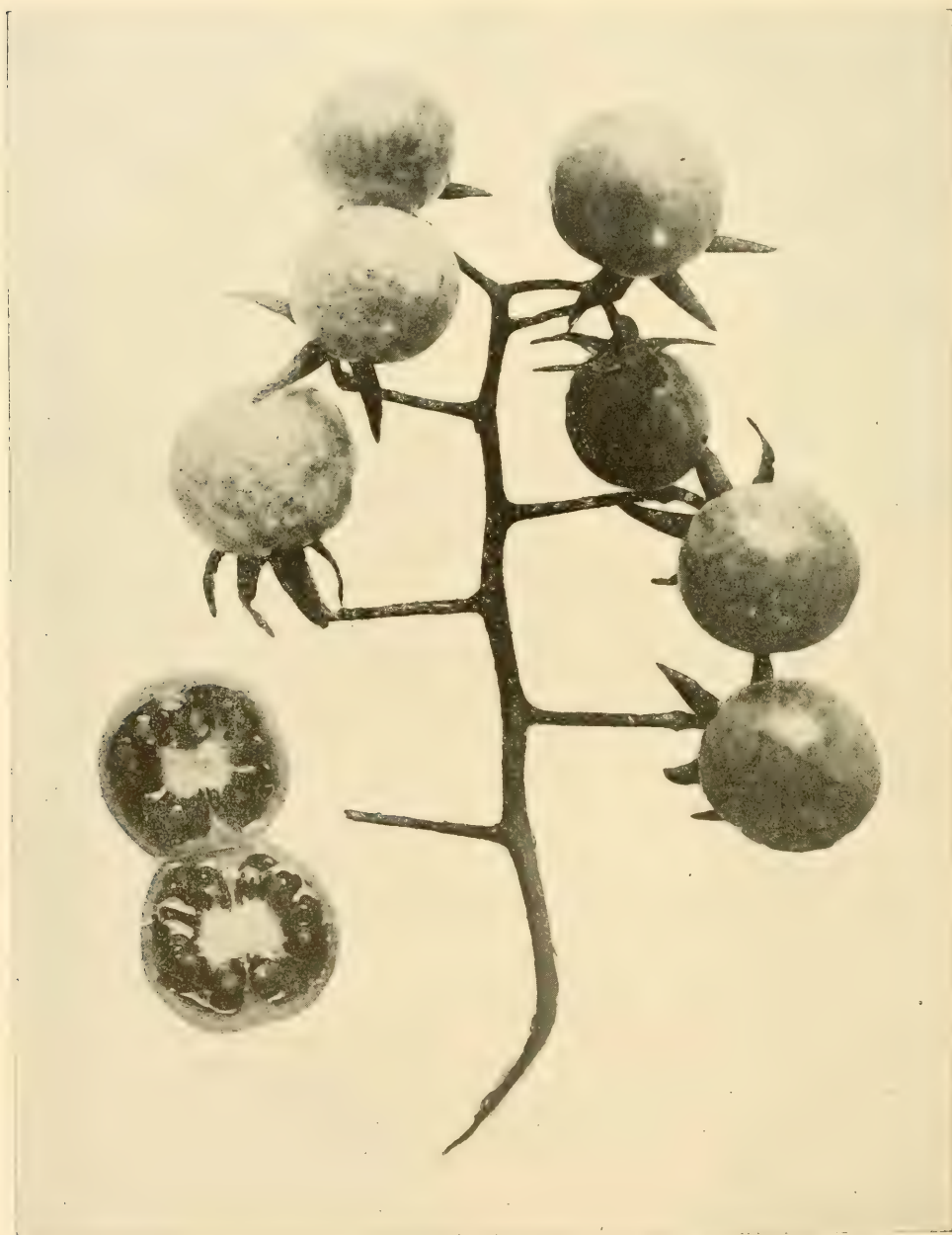
A patch of timber or a wood-lot without squirrels always conveys an impression of lonesome solitude and something gone—like a country graveyard. There is no other animal of equal size that can add so much of life and cheerfulness to a hardwood forest or a meadow as a hardwood forest squirrel. Why is it that American men and boys kill them so eagerly? Surely the flesh of their little bodies is not needed as food. It has a taste so queer and rank that to many persons it is decidedly unpalatable. Americans are the only white men on earth who eat squirrels. An Englishman would as readily eat a rat!—William T. Hornaday, Sc. D., in "The American Natural History."

The Wild Tomato.

BY CHARLES H. GABLE, FUNCHAL,
MADEIRA.

"The little wild tomato (*Lycopersicum vulgare cerasiforme*) which is found in Madeira is generally considered by botanists to belong to the original stock, native in South America, from which our cultivated varieties have been de-

rived. It grows wild in many parts of the islands, often under desert conditions, and in appearance the plant is quite similar to the garden varieties. One plant was found where it could not have had a drop of water for at least three months. It probably had started to grow during the last few rains of spring but had completed its growth during



THE WILD TOMATO.
From "The Journal of Heredity" by permission.

the heat and drought of summer. When it was found, the vine was apparently dead and lying flat on the ground; the leaves had dried up and dropped off; but more than 300 fruits, all plump and firm, were clinging to the vine. The fruits are so very acid that they can be used for little else besides soups, and the natives do not use them a great deal for even that. Their keeping quality, however, might prove a desirable characteristic in crossing with some of the highly developed varieties with the object of obtaining a good shipping tomato of pleasing flavor. Photograph, actual size."

The illustration and permission to publish this article were obtained through the courtesy of "The Journal of Heredity" of the American Genetic Association, Washington, D. C.

Men as Well as Women are Curious.

Dorothy Dix, the well-known writer for "The New York Journal," says that the old-time statement that women have more curiosity than men is without foundation. We are inclined to agree with her.

"Ever since that apple incident in the Garden of Eden," says Miss Dix, "the feminine sex has been called the curious sex, and men have derided and geyed us for peeking and prying into other people's affairs, and nosing around into things that were none of our business.

"And we've accepted it all as gospel truth, and let men convince us that we had more curiosity than they had, whereas the truth is that women have no curiosity at all compared to men.

"Take, for example, such a common, everyday occurrence as the hoisting of a safe by means of pulleys and ropes up to a third or fourth story window. In every city in the world that's done every day. There's nothing new or startling about it. Probably there isn't a city man living who hasn't seen it done dozens of times, yet every time the act is performed such a big crowd will gather around it that it will stop traffic in the street."

Miss Dix also cites the familiar operation by which a man puts a new tube into an automobile tire. That always draws a crowd. Look also at the hundreds of men crowding before bulletin boards. Women can restrain their curiosity and wait to read about

the game in the newspapers. Miss Dix also asserts that the husband is more desirous than the wife to learn what has happened during his absence, not because he is jealous or suspicious or begrudging of the money that the family has spent, but because it is "his inordinate curiosity that clamors to be gratified."

Then Miss Dix tells us that men have always been the world's great discoverers, and that woman has no more curiosity to see what is at the North Pole than she has to see what is in the back yard. Nor does she care what is in the heart of darkest Africa. Most women have so little curiosity that they never strive to extend nor to go outside of their own little circle of interests and acquaintances. Then she sums it all up.

"It's man's curiosity that has made him delve into things and wrest her secrets from nature. Man calls it original research, but it is only curiosity."

She admires this quality and calls it a sign of intelligence.

Any one who has had much experience in teaching nature study will bear witness that Miss Dix is absolutely correct. The writer has had many years of experience with all kinds of audiences and in schools of various grades. Invariably he has found that, when talking to girls, nature must be portrayed as beautiful, sentimental, whereas with boys one must go directly to the subject in hand and show what is in it, how it is formed, how the thing is done, what is on the inside of it. The boy wants to know. The girls cares but little for detailed structure of plants or animals. It is noticeable in the laboratory that in explaining the machinery of organisms to women they exclaim over the beauty and care exemplified, and little heed the mechanics or the structural details. On the other hand the man says nothing about beauty or sentiment, but wants to know about the action. "What is it doing and how is it doing it?" There are, as in other general rules, remarkable exceptions. I once knew a lady, the daughter of John Muir of California, who had turned her bedroom into a machine shop, filled with parts of locomotives. She is intensely curious about all kinds of machinery. I have known many women

who have acquired skill and fame in original scientific research. On the other hand, there are some men who see not the mechanics but rather the poetry and the artistic aspects of nature. The boy and the man want to see the wheels go round, the girl likes the watch for its usefulness and beauty.

Of Cats' Coats.

R. I. Pocock, the superintendent of the London Zoological Society's Gardens, points out that there are really two different sorts of cats, though they both come in all colors. One is the common striped tabby, with narrow wavy markings running crosswise of the body. These stripes are sometimes slightly thickened, or they may break up into spots. But the pattern is always the same and recognizable at a glance.

The other sort is quite different and much more uncommon. Instead of the many narrow stripes lying in the direction of the ribs, there are a few wide irregular blotches, at least three of which run lengthwise of the body, across the ribs. These give the peculiar "horseshoe," "spiral," or "target" pattern. Besides this, there is a well-marked band on each side of the backbone, and a curious diamond-shaped area on the back of the neck, where the five narrow head stripes are left out. All this is quite distinct, and quite unlike the pattern of the common striped tabby.

Where this pattern came from, nobody knows. The common tabby is descended from the ancient Egyptian cat, which the Pharaohs used to venerate when alive and embalm when dead. This also had the tabby pattern. So, too, has the European wild cat. But no known sort of cat, tiger, lynx, or anything of the kind has the other, "blotched" pattern.

Mr. Pocock suggests also that anciently, in Europe, long before the advent of civilized man or the beginnings of history, there were various sorts of wild cats besides the single one that has survived to the present day. We know these only by their bones. Their coats may have been anything. One or more of them may have been a blotched tabby, whose coat pattern still survives.

Greatness and Early Marriage.

Casper L. Redfield of Chicago is of the opinion that all the eminent persons of history are from the late-marrying, slow-breeding stocks which have three generations or less to the century; while the great majority of mankind, who marry early and have four generations to the century produce only mediocrities.

To test his theory, Mr. Redfield deposited two hundred dollars with the treasurer of the American Genetic Association, which the Association might keep if any of its members, (several of whom have expressed opinion contrary to his own) could meet the following challenge:

(1) Half the sum for a single case among the two or three thousand persons known to history for their intellectual powers, where the eminent individual was born within a century of the average birth date of his sixteen great-great-grandparents; or in other words, was the product of breeding four generations to the century. Three examples, counting male ancestors only, would also win the wager.

(2) The other half for a single case where a man of the highest grade, such as Aristotle, Franklin, or Darwin,—of whom there are some two or three hundred known to history—whose male forbears were even in the three-generations-to-the-century class. For it is a part of Mr. Redfield's theory that the highest types of ability can be produced only at the rate of two-and-a-fraction generations to the century in place of the four of common mortals.

The offer printed in the Journal of the Association stood for nearly a year, and the time limit has just expired. Various persons, among them several expert genealogists, took up the gage. But nobody was able to score, and the Association has returned the funds.

As the case now stands, therefore, the persons who make civilization are the offspring of late marriages; while, to quote Mr. Redfield, the thirty-three states which permit legal unions between boys from fifteen to nineteen and girls from thirteen to seventeen, are encouraging the rapid generations which "lead to the production of mental and moral defectives."

Insectivorous Plants.

Through the courtesy of the "Missouri Botanical Garden Bulletin," we present herewith a cut of a group of plants that eat insects. We all know that some insects eat plants, but it is not generally known that many plants have devices for catching, killing and literally eating insects. It has been ascertained by experiment that the majority of such plants use the captured animals as food.

Some of these contain chambers into which small animals may enter but from which they cannot escape. Such plants exhibit no movement of any kind. An-

other class uses actual movement in catching their prey, which is subsequently digested and absorbed. For two or three years specimens of the Venus's fly-trap were kept growing in ARCADIA under close observation. In some instances flies that were caught had evidently been recently entrapped for they were active in their efforts to escape, but no one had the good luck to see the plant actually catch the fly. We should be glad if our naturalists will make observations and report on any form of insectivorous plants that may grow in their vicinity.



A GROUP OF INSECTIVOROUS PLANTS.
 Drosera. Sarracenia.
 Pinguicula.

Dionaea.



DOG TEAM BRINGING HAY TO THE BELGIAN COMMISSARY IN ANTWERP.
Cut by courtesy of The American Society for the Prevention of Cruelty to Animals.

Dogs Are Astonishingly Strong.

Here is a remarkable illustration of a heavy load drawn by a pair of dogs. To look at this load of hay, especially at the cart, one would say, "It is a pretty respectable burden for a pair of horses." That does not mean that it would be difficult for a pair of horses, neither would it suggest that it is too small for a pair. It does mean, however, that it is too much for a pair of dogs.

The Compass in the Watch.

A few days ago I was standing by an American gentleman, when I expressed a wish to know which point was north. He at once pulled out his watch, looked at it, and pointed to the north. I asked him whether he had a compass attached to his watch. "All watches," he replied, "are compasses." Then he explained to me how this was. Point the hour hand to the sun, and the south is exactly half way between

the hour and the figure 12 on the watch. For instance, suppose that it is 4 o'clock. Point the hand indicating 4 to the sun and two on the watch is exactly south. Suppose that it is 8 o'clock, point the hand indicating 8 to the sun, and the figure 10 on the watch is due south. My American friend was quite surprised that I did not know this. Thinking that very possibly I was ignorant of a thing that every one else knew, and happening to meet Mr. Stanley, I asked that eminent traveler whether he was aware of this simple mode of discovering the points of a compass. He said that he had never heard of it.

I presume therefore, that many are in the same state of ignorance. Amalfi is proud of having been the home of the inventor of the compass. I do not know what town boasts of my American friend as a citizen.—The London Truth.

Plant Motions and Growth.

Professor Jagadis Chunder Bose of the University of Calcutta, who has been spending the winter travelling and lecturing in "The States," is probably the world's first authority on the movements of the common higher plants. He is originally a teacher of physics, and being accustomed in that precise science to delicate apparatus and accurate measurement, he has latterly turned that experience to the minute motions of the plant world. Among other delicate tools, he has invented one that will record the growth of a tendril-tip during each half minute, and by distances less than the thickness of tissue paper, show the change of rate with alterations of temperature or water supply. Still another will exhibit the turning of a green leaf toward the flame of a match held near it for only ten seconds.

By such means as these, Professor Bose has been able to prove that the green plants are essentially like cold-blooded animals. Their tissues are at the same time both nerve and muscle; and they respond like an animal to heat and cold, electric shocks, scratches and pin pricks. They are even af-

fectured by drugs like a very sluggish animal, and have a true rigor mortis when they die.

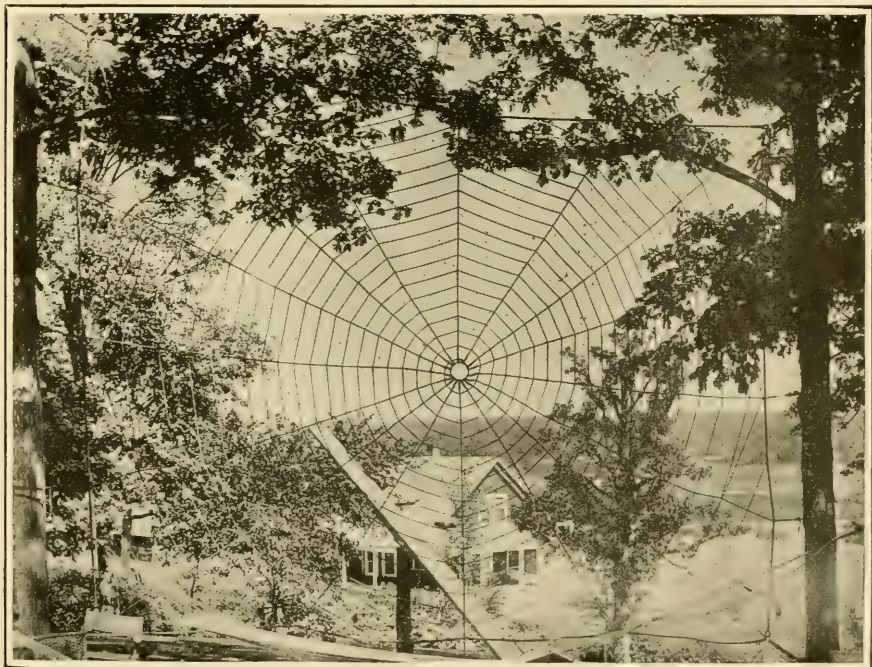
The Largest Spider Web in the World.

BY ROBERT H. MOULTON.

The largest spider web in the world was spun, not by a spider, but by human hands. It stands on the lawn of a Chicago man's country home, and is of such tremendous size as to startle the passerby when he first sees it.

The creator of this interesting oddity conceived the idea of attempting to see how closely an actual spider's web could be reproduced with rope. Selecting two immense trees on the lawn of his home, he spun between them this spider's web, forty by sixty feet, which is so strong that a boy or man may easily climb to the center or top of it.

The web faces the main thoroughfare, which passes the house, and is one of the most fascinating country ground decorations ever seen. The spinner could not attain the minuteness of the actual spider's work, but came so near to it that the illusion is almost perfect. The uniqueness of the undertaking catches and fascinates every eye.—Scientific American.



THE SPIDER WEB OF ROPES.
Cut by courtesy of "Scientific American."

A New Fossil Fig and Its Significance.

BY EDWIN W. HUMPHREYS, NEW
ROCHELLE, N. Y.

Some time ago, the writer drew the attention of the readers of *THE GUIDE TO NATURE* to some interesting fossil figs from the Tertiary deposits of Wyom-

This new fig was found more than a year ago by Dr. S. J. Schofield of the Canadian Geological Survey in the Pleistocene deposits of the Kootenay Valley of British Columbia, Canada. The specimen along with others was finally sent to Dr. Hollick at the New York

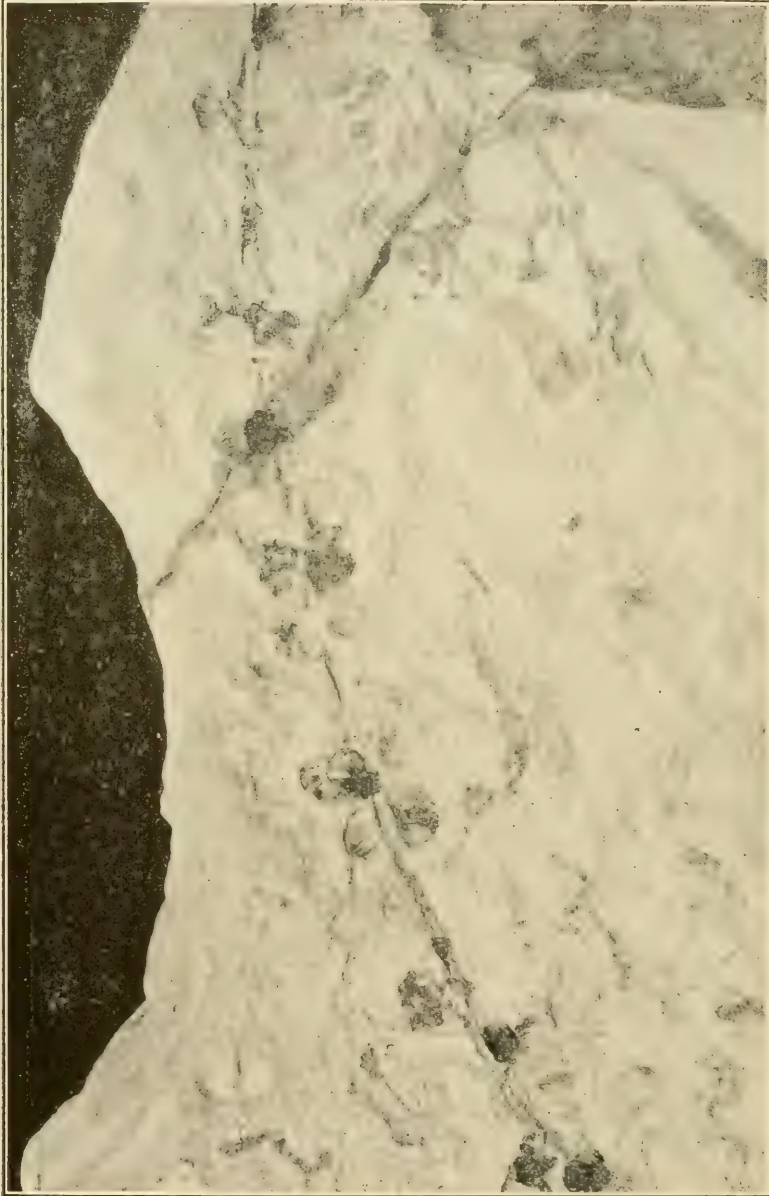


FIG. 1. THE INTERGLACIAL FIG (*FICUS INTERGLACIALIS* HOLLICK)
PHOTOGRAPHED NATURAL SIZE.
(From illustration accompanying Dr. Hollick's paper.)

ing and Montana. Recently a still more interesting fig has been described and illustrated by Dr. Arthur Hollick in the March number of the *Journal of the New York Botanical Garden*. Figure 1 is a photograph of the entire specimen, natural size.

Botanical Garden for determination.

Careful study and comparison with the fruits of plants now living demonstrated that the specimen is a defoliated, fruiting branch of a fig tree, closely allied to the general type of cer-

tain figs now living in Mexico and the West Indies.

A glance at Figure 2, which is enlarged to twice the natural size, will show the characteristic incurved apex of the figs. The shape, striations, and method of attachment also indicate the relation of the fruits of the figs.

passing from the great past to the present. It is the period during which more than six or eight million square miles of the earth's surface which had previously been enjoying a mild climate was covered with immense glaciers. Estimates as to how long ago this period closed vary in round numbers from



FIG. 2. PORTION OF FIG. 1 ENLARGED TO TWICE NATURAL SIZE.
(After Dr. Hollick's plate CLIII.)

The interglacial fig—as it may be called, the scientific name being *Ficus interglacialis* Hollick—is not so old as the ones described from the Tertiary. As has been stated it grew during the Pleistocene period which is the last step in

about ten to fifty thousand years.

Aside from its being a new species the interglacial fig is invested with additional interest due to its climatic significance. A well defined specimen of the genus *Ficus* would, Dr. Hollick states, be re-

garded as evidence of tropical or sub-tropical climatic conditions. Hence, it is to be inferred that while the specimen under discussion was growing tropical or sub-tropical conditions prevailed.

This inference is strengthened by the luxuriance of the contemporaneous vegetation as shown by the large size of the fossil leaves and by the presence of certain remains which suggest *Yucca* or some kind of a palm.

Finally, the fossil plants from the Pleistocene of east Canada, in the Don River Valley, indicate a cooler climate for that part of Canada during their period of growth. Whether the Kootenay Valley and the Don River Valley Pleistocene floras were contemporaneous or not is not at present known. Although Dr. Hollick does not disregard a different conclusion, the fact that they may have been so taken in connection with other suggestive facts leads him to conclude his paper as follows, "We may have, therefore, in this recently discovered Pleistocene flora in British Columbia, the heretofore missing link of evidence tending to show that contemporaneous regional climatic differences between the west and the east on our continent have prevailed more or less continuously ever since Cretaceous time."

Cuts by courtesy of the New York Botanical Garden.

Recent English records show that in certain especially dusty and smoky cities, the dirt that falls from the air may occasionally reach the enormous amount of sixty tons on a square mile during a single month.

God in Nature.

BY H. GORDON HAWKINS, WESTFIELD, MASS.

Oh, the wondrous beauty of them all,
The flowered dell, the mountain wall,
The viny bower where hides the silver spring,
The lacy wood where numerous wood birds sing.
The fallow field, the unploughed hill,
The slow brook running past the mill,
The leafy cover, where red deer leap in sight,
The wooded slope bathed in the morning light,
All these, God's gifts, are to our weary gaze
Far better than an idle song of praise.
We learn His lessons from the whispering trees
From warbling birds and playful breeze.
From silent rock and rushing storm
And from the sunbeams, dancing warm,
And even in the dying flowers,
We learn the lesson of the hours.

Knowing Too Much to Be Helpful.

In this work as a magazine writer I learned a lesson from my father which has exerted a controlling influence upon me in my editorial life. Mr. Fletcher Harper asked me to write an article for the "Magazine" on ocean steamship travel. I told him that I could not do so because I had no other knowledge of the subject than such as I had gained from my one voyage across the ocean. "Then ask your father to write it," said he. This I did.

"Why do you not write the article yourself?" asked my father.

"Because I know nothing of the subject," was my reply.

"Then," said he, "you are just the one to write it."

"How is that?" I asked.

"Because," said he, "the object of the author of a popular magazine article is to give knowledge of a subject to people who are wholly ignorant of it. To do that he must know both the subject and the condition of ignorance. If he is familiar with the condition of ignorance, he can make himself acquainted with the subject; but if he is thoroughly familiar with the subject it is almost impossible for him to acquaint himself with the condition of ignorance."

Whether I wrote the article or not I forget, but this principle, laid down by my father, became my guide when later I took up editorial work. I have found it almost uniformly true that an expert cannot write on the subject with which he is familiar what readers who are not familiar with the subject can understand. The experienced but non-technical writer must provide the article, and it must then be submitted to the expert to make sure that he has fallen into no serious errors.—Dr. Lyman Abbott in "The Outlook."

There is a corollary from this Q. E. D. A technical organization or institution can never successfully popularize natural science. It requires a separate organization that may draw from technical sources accurate data to be popularized.

Matter has more intricacies, delicacies and potencies than the mind of man has been able to discover. Not that matter is greater than mind but it has been touched to finer issues by a finer, higher mind.—Bishop H. W. Warren.

The Nature Photographers

The Most Beautiful Woman in America.

The Ansco Company, Binghamton, New York, has spent more than \$5,000 in trying to find, from the photographers' point of view, the loveliest woman

City. Mr. Conklin writes as follows:

"The young woman was here at school and the photograph was made in the ordinary course at the time of her graduation. I probably made six or eight negatives at that time. This was nearly two years ago, and while I always considered it an especially attractive picture, permission to use it was withheld until last fall.

"Miss Johnstone is now with the 'Watch Your Step' musical comedy company, and I understand that competent judges have decided that her features approach as near the ideal as is possible, and that among numerous other flattering attentions, one of the South American Republics has reproduced her head on some of their coinage."



FIRST PRIZE WINNING PORTRAIT ANSCO COMPANY'S \$5,000 LOVLIEST WOMEN CONTEST.

\$500, first prize won by Philip Conklin, Troy, New York; subject, Miss Justine Johnstone, New York City. This portrait, together with the entire collection of prize winners, is now on exhibition at the Ansco Company's booth at the Panama-Pacific Exposition, San Francisco, California.

Published by courtesy of the Ansco Company, Binghamton, New York.

in America, and incidentally the photographer sufficiently skillful to portray that woman. The first prize of \$500 was awarded to Philip Conklin of Troy, New York, who photographed Miss Justine Johnstone of New York

City. Examination of the stomach contents of bats indicates that their food is more than nine-tenths moths, the rest being beetles and other insects. Attempts to utilize these animals to keep down mosquitoes have therefore failed.

San Antonio, Texas.

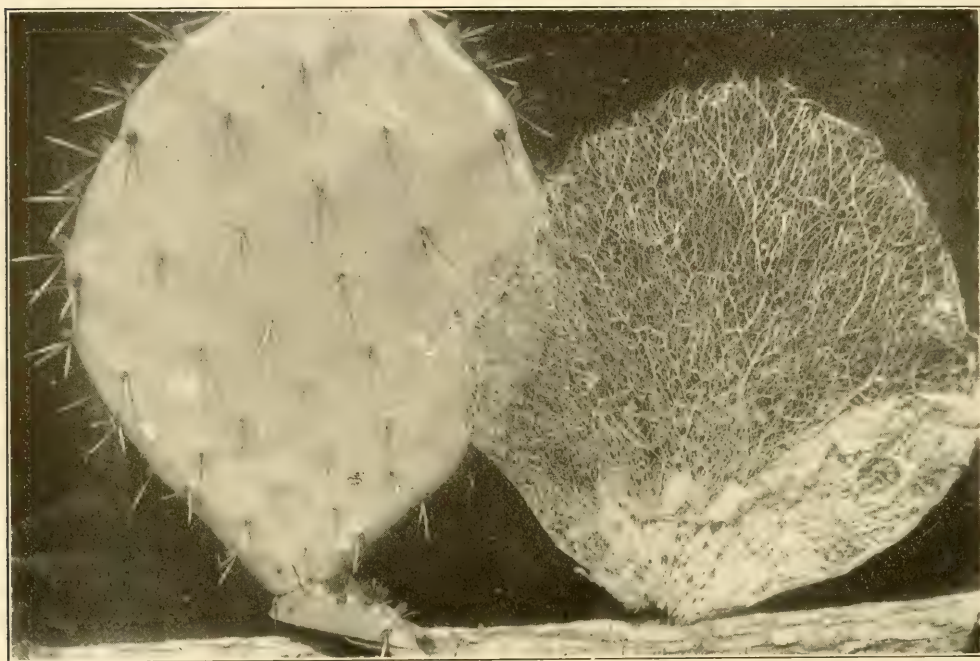
To the Editor:

I send to your fine magazine, *THE GUIDE TO NATURE*, an interesting view of two of our Texas cactus leaves, a

tissue. I prepared the photograph at the farm pasture of a good friend and great nature enthusiast, Mr. Lee Hoyt, of the Leona valley.

Sincerely yours,

DR. R. MENDER.



TWO CACTUS LEAVES FROM TEXAS—ONE FRESH FROM A GROWING PLANT AND THE OTHER TO SHOW THE FRAMEWORK.

large fresh one from a growing plant, and another showing the framework or skeleton with its beautiful network and ramifications intact. They were gathered by me during a late outing at our lovely Leona hills, close to San Antonio, where miles of wild cactus jungles exist in uncultivated pastures and open prairies.

During late and remote floods near the Leona creek numbers of these leaves were carried away and lodged in the trees and shrubbery—some as high as thirty and more feet above the ground. In one place, where earth, all sorts of debris, cactus remnants and sand had accumulated, there were several leaves, whole side branches showing such leaves and root stems denuded of their succulent parenchyma, leaving only the fibrous network, similar to that shown in the photograph. This specimen, from years of exposure to the elements, and its incomplete covering of sand and soft earth, lost all its integumental covering except at a few spots near the base that show outlines of the original external

Look Up!

Look up, at the stately trees,
Look up, at the winsome flowers
Which nature's lavish hand
Has woven through the bowers.

Look up at the hills around,
All verdure-clad, serene;
Look up at the mountains bold
O'er nearer hilltops seen.

Look up at the clear blue sky,
Look up at the stars at night,
At clouds that are sailing by,
The moon with its silvery light,

Look up as you go along,
'Twill broaden all your way;
Look up till the habit grows,
And adds a zest to your day.

—Emma Peirce.

Clarence King, the first head of the United States Geological Survey, writing in 1880, opined that the mineral output of the country might sometime in the distant future reach a value of a billion dollars a year. Already it is two and a half billions.

A Multiplicity of Young.

Cincinnati, Ohio.

To the Editor:

I send two puzzle pictures for the readers of *THE GUIDE TO NATURE*. This mother 'possum was caught on August 1st, 1914, because, as usual, she feigned death or "played 'possum." Examination showed that nine young ones were twined about her tail. Her captor carried her for at least half a mile as shown in one of the pictures. The entire family is now confined in a public park in Chillicothe, Ohio. The capture occurred on the farm of Mr. George Core, Frankfort, Ohio. In view of the vanishing wild life in this country, this seems to be well worth publishing. I doubt if many such finds are made now. I know Mr. Core



THE MOTHER 'POSSUM AND YOUNG

personally, and can vouch for the number of young. On looking up the subject I find that the 'possum may have as many as sixteen young. There may be two or three litters a year.

Yours sincerely,

G. A. HINNEN.

Tests in Soil Fertility.

The new theory of soil fertility, that fertility is due to bacteria in the soil and sterility to infusoria that prey upon the bacteria, is soon to have a thorough try-out. An association has been formed in England of nurserymen and market gardeners, who have subscribed ten thousand dollars for the plant of an experiment station and promised another forty-five hundred a year for running expenses.

The special line of study will be the partial sterilizing of soils to just the degree which destroys the infusoria but spares the somewhat more resistant bacteria. Laboratory experiments have already shown that lime, steam at 100 degrees instead of the customary 130, chloroform, carbolic acid, carbon bisulphid, and toluene can all be given in such accurate graduated amounts as to kill the animal life in the soil without affecting the vegetable. The soil then remains fertile until dust or earth from tools or shoes infects it once more.

The problem now is to reduce the laboratory to a commercial basis.

MEADOW-RUE.

As foam on crested wave is seen,
So meadow-rue on sea of green.

—Emma Peirce.



METHOD BY WHICH THE CAPTOR CARRIED
AN OPOSSUM FAMILY FOR NEARLY
HALF A MILE.

A Photograph of a Lynx Cat.

Mr. S. C. Baker of Wallingford, Vermont, sends us an interesting and lifelike photograph of a lynx cat. Its length



A LYNX CAT.

was five feet from tip to tip, its weight fifty-one pounds. It was shot by Mr. A. E. Rodgers of Wallingford.

The Abandoned Art of Microphotography.

What is microphotography? Do not confuse it as it is often confused, with photomicrography.

Photomicrography is a large photograph of a microscopic object. It is usually made through a microscope by the aid of microscope objectives alone or with the addition of the eyepiece.

Photomacography is a term less frequently used but is employed by some opticians to designate enlarged photographs of moderately small objects. The work is done with short focus camera lenses and usually with a long camera.

These are but two forms of magnifying photography, although the distinction between the two is not always absolutely sharp and fast.

Microphotography is exactly the reverse and consists of carrying to an extreme minimizing photography. Nearly all ordinary photography with a camera stands about the same relation in minimizing that photomacography has to

magnifying. For example, a child with a small camera takes a picture of his schoolmate who is four feet tall. The photograph is perhaps an inch in height. This is a micro photograph; the object is reduced in size. Your friend may also be microphotographed so that you may examine his picture under the microscope. Such photographs are invisible to the naked eye. While these microphotographs are extremely interesting and a few of them are to be found in nearly all microscopical cabinets yet the making of microphotographs is practically an abandoned art. There is one microphotographer in Germany and another in Manchester, England, but so far as an extensive correspondence has revealed there are few workers in this country.

Mr. Edward Pennock of Philadelphia writes as follows:

"Francis T. Harmon, 3920 Ellis Avenue, Chicago, Illinois, has been doing some good work in this line of late; he has sold some microphotographs of 'The Declaration of Independence' made from an old copy (engraving) which I obtained for him at an old-book shop here, and which I believe is the same as the one copied by Langenheim in Philadelphia along about 1860 or thereabouts."

When these photographs were popular as interesting things with which to entertain the microscopist's unscientific friends, such objects as the following were common: "A Ticket to Heaven" (a card of admission to a Sunday School bearing much good advice); "The Lord's Prayer"; Landseer's "The Stag at Bay"; Gray's "Elegy"; the Presidents of the United States; Niagara Falls, and similar subjects. These, and others like them, had no natural science value. They are preserved in our cabinets of slides as curiosities.

Photomicrographs are vastly different. These are usually instructive and valuable, permanently recording the microscopic structure of objects otherwise invisible, and probably incapable of being made visible to the majority of human beings. Scientific magazines and similar publications and their readers would suffer great loss if photomicrography should cease to exist, of which there is not the slightest danger.

Lines to the Violet.

BY H. GORDON HAWKINS, WESTFIELD, MASS.

O gentle, shy, retiring flower
Of green banked dell and mossy wood.
Little knowest thou thy power
That within us works for good.
For when petulant and weary,
We see thy gently nodding head,
Gone is the thought that life is dreary,
And all our evil dreams have fled.
And ever in thy clear blue eye,
Where with our thoughts we sense thy worth,
We see the trace of Him on high
Who holds the destinies of earth
And rules in love.

Some Fishing Experiences.

Philadelphia, Pa.

To the Editor:

Grassy Sound is a summer fishing place with about one hundred cottagers who spend only the summer months there. It is on Hereford Inlet, an arm of the Atlantic Ocean, near Anglesea, at the end of the Jersey coast near Cape May.

The following notes of my fishing experiences at this place may be of interest to some of your readers.



AN EIGHTEEN POUND SHEEPSHEAD.

Last year I caught a seventy-five pound channel bass; this year an eighty pound one, that fought for his life for half a mile, while the boat drifted with the tide.

An eel, the largest ever caught in the Sound, weighed ten pounds and measured nearly five feet in length. I got it into the boat with my bare hands, in spite of its size and slipperiness.

Sheepshead are rare and hard to catch. One may fish for weeks and not get one. It is a slow biter and generally hangs around old piles, wrecks of boats and overhanging banks where there are mussels, fiddler crabs or soft clams. It is a handsome fish with black and yellow stripes, and big teeth like those of a sheep with which it crushes the hard shells of its favorite food.

Sharks come in the Sound in schools, and either follow a school of small fish in or come in after small fish. When swimming it always shows its dorsal fin. When it is hooked, the struggle becomes furious, but the shark is speedily exhausted.

There is nothing artificial about the photograph of the snake. It shows the



A TEN POUND EEL.



A SNAKE SUNNING ITSELF.

reptile exactly as I saw it, sunning itself in an old tree. I approached near enough to get this good sized picture. It seemed to be a ground snake. No water was near.

Yours respectfully,
HARRY BEELER.

Tests of the ability of various birds to pick out their food against different backgrounds show that such birds as make a quick rush for their prey take non-protectively colored objects nine times more frequently than they take those which resemble the surroundings. Such birds, however, as approach slowly and look before seizing, seem hardly at all to be influenced by concealing patterns.

Novel Position for *Cereus*.

Westport, Isle of Pines, W. I.

I send a photograph which I hope will be of interest to you. It is of a night-blooming cactus taken on May 5th, between 5 and 5.30 a. m., with a Zeiss Protar on a Standard Orthonon plate. It was taken wide open (6.3) and 10 seconds' exposure. The early morning was very foggy.

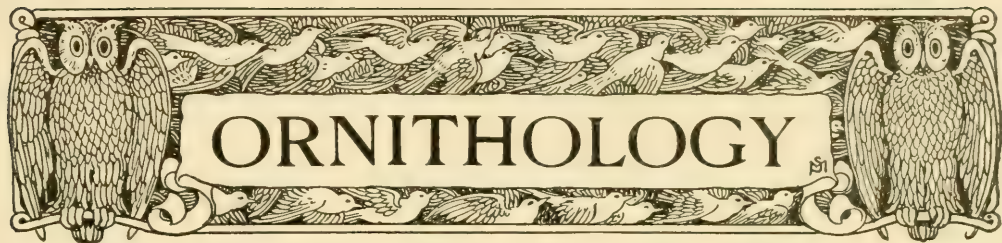
The blossom is beautiful, being white tinged by buff and with a yellow center. This special plant had eight blossoms at the same time and twenty-six buds. It is native here, although it is not common. As a rule it grows in the jungles. This particular specimen was flourishing on a post palm together with orchids and ferns. The mass is about as big around as a barrel.

We have had this wonderful thing for more than two years, having brought it post and all from the coast, but a heavy rain broke the whole mass from its support after the photograph had been taken.

Yours truly,
A. C. READ.



ABOUT AS BIG AROUND AS A BARREL



Former President Roosevelt Visits Louisiana's Vast Bird Island Reservation

The visit of Col. Theodore Roosevelt to the many bird island reservations, many of which he set aside for this purpose while president, and game preserves of Louisiana during the first part of June has aroused considerable interest in conservation measures practiced there for bird protection.

As the guest of John M. Parker, a

break, June 8th, and the course was laid so as to circle the long stretches of Chandeleur, Errol, Free Mason, North Harbor, Battledore, Hog, Grand Cochere and Breton islands.

These islands all lie east of the many-mouthed delta of the Mississippi river and are given over almost wholly to the terns, gulls, skimmers, pelicans, men-o'-warsmen and shore birds that breed in the south. Vast colonies of these birds flock to these islands to lay their eggs



COLONEL ROOSEVELT INSPECTING THE NESTING COLONY OF ROYAL, CASPIAN AND CABOT TERNS, LAUGHING GULLS AND BLACK SKIMMERS ON BRETON ISLAND.

noted Louisiana sportsman, and the Conservation Commission of Louisiana, Col. Roosevelt was given the opportunity of setting foot on the sandy shores of the many low-lying islands that guard the delta coast of the Pelican State from the high rolling waves of the, at times, turbulent Gulf of Mexico. The trip, which consumed a solid week, began when the Conservation Commission's yacht "Daisy" left Pass Christian at day-

either on the sand or in the rough nests they construct. Various sized colonies ranging from ten to twenty thousand individuals were inspected but it was not until he went ashore on Breton Island that Col. Roosevelt realized the extent of the protection and the multitude of birds given sanctuary to-day in Louisiana.

At Breton Island the Roosevelt party was joined by M. L. Alexander, presi-



COLONEL ROOSEVELT, PRESIDENT M. L. ALEXANDER (IN THE CENTER) AND AUDUBON WARDEN EXAMINING A ROYAL TERN EGG.

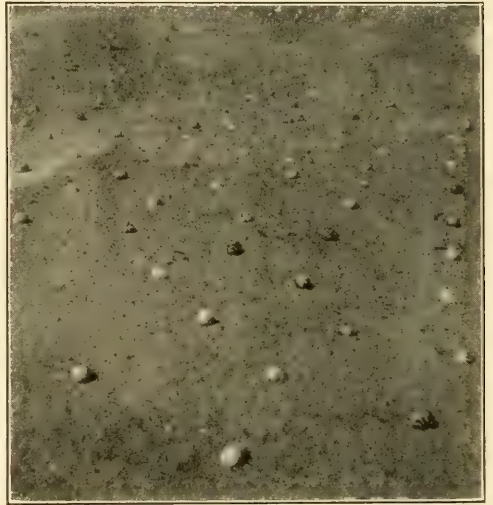
dent of the Conservation Commission of Louisiana, and Stanley Clisby Arthur, the commission's ornithologist. The head of the commission found a ready listener in the former president when he went into the details of conservation work now practiced in Louisiana.

Breton Island proved a revelation to Col. Roosevelt. A two-mile stretch of sandy beach was covered with the eggs of the Royal, Caspian and Cabot terns and black skimmers. Back from the beach the mangroves and salt grass were filled with the nests of about fifteen thousand laughing gulls. At the approach of the party, sections of the vast colony, estimated to be over a hundred thousand, took the air in a beautiful fluttering flight of snowy wings, settling back on their eggs, however, as the party moved forward.



A ROYAL TERN COLONY ON BRETON ISLAND

For an hour the former president sat on the beach and with his binoculars studied the nesting habits of the various species, the peculiarities of flight, and saw for the first time the reprehensible habit of the laughing gull in pouncing on the unguarded egg of the terns, breaking it open with its stout bill and feasting on the contents. Many other habits were noted and discussed with Herbert K. Job, head of the Department of Applied Ornithology of the National Association of Audubon Societies, who accompanied the former president to make the pictures for his magazine articles, and Mr. Arthur, who in his work for the Louisiana commission, has made a special study of breeding customs practiced by the southern breeding birds.



A VIEW SHOWING HOW TERN EGGS ARE DEPOSITED ON TWO MILE STRETCH OF SAND ON BRETON ISLAND.

The patrolling system of protecting these breeding islands from human molestation during the summer months was explained to the distinguished naturalist by President Alexander and the commission's work in this regard was highly commended by Col. Roosevelt, who also showed lively interest in the other natural resources of the state under the jurisdiction of the commission.

It is expected that Col. Roosevelt will make a second visit to Louisiana during the coming winter to investigate the great game and water-fowl refuges, Marsh Island, The State Game Preserve, the Ward-McIlhenny and Rockefeller Foundation, when the ducks and geese are there.

Swifts and Weather.

West Devonport, Tasmania, Australia.
To the Editor:

Perhaps the following note may be of interest, and may induce some of the readers of the *THE GUIDE TO NATURE* to study and record the movements of the American members of that extraordinary group of birds—the swifts. In a paper read before the Royal Society of Tasmania I endeavored some time ago to trace a connection between the appearances of the spine-tailed swift (*Chaetura caudacuta*) both in this state and in Victoria (Australia) and disturbed weather conditions, showing that in all cases which had come under my notice the appearance of this swift meant atmospheric change. This was again strikingly demonstrated on the twenty-seventh of February of this year, when in the morning I saw fifty or sixty of these fine birds coursing insects over the paddocks. The day was sultry but fine. Soon afterward I met a friend who spends most of his life out-of-doors and, like myself, takes pleasure in noting natural objects. I told him that I had just seen a large party of swifts for the first time this summer, the twenty-seventh of February being near the end of summer with us in these southern latitudes, when he remarked, "Then rain is not far away." That very evening a light rain began to fall, and practically the whole of the following day was wet. Not only so, but for several days afterward we had high winds and showers, culminating on the seventh and eighth of March in a tremendous northwesterly gale, which did a great deal of damage. All this disturbance came after months of fine settled weather. On the ninth of March the swifts were migrating from southeast to northwest, passing in twos and threes every few minutes, from two to four o'clock, during the afternoon. As this species is often with us until April and I have seen it as late as the twenty-seventh of that month, I took this early departure to mean rough and cold autumn weather, a supposition which has since been abundantly verified. Some notes of mine on the subject were sent to the Tasmanian Field Club, which has its headquarters in Hobart, at the end of the state opposite to that in which I reside, and were read by the secretary at a recent meeting. Considerable discussion ensued, most of the members agreeing, however, that the

sudden appearance of the spine-tailed swift, especially if flying low, after a long spell of fine weather, indicates a break-up of anticyclonic conditions. I was pleased to receive this confirmation of my series of observations which cover a good many years.

H. STUART DOVE.

John Burroughs's Diet.

This veteran naturalist, who has recently passed his seventy-eighth birthday, tells us that he is now in better health and is better able to do his work than he has been for years. In an interesting article in "The Ladies' Home Journal" he says:

"Old age is not such a bugaboo after all. He is, in many ways, better to live with than Youth, because he leaves you more at your ease; you are in the calmer waters; the fret and fever of life have greatly abated. Old Age brings the philosophical mind; he brings a deeper, wider outlook upon life; he brings more tolerance and charity and good will."

As a part of his experience we learn the astonishing fact that he has discarded from his dietary eggs and raw apples. He also says, and this is less surprising, that he avoids pastry, new bread, coffee, tea, iced drinks and all alcoholic beverages, but the most amazing thing is that he uses neither eggs nor raw apples. It has been generally supposed that these are the prime factors in the diet of one that lives near to nature. But Mr. Burroughs believes that eggs are poison to some people. He was induced to discard them through the influence of Professor Chittenden's book, and by the fact that no eggs were given to the Yale students upon whom Chittenden has been experimenting with various systems of diet. In a personal letter to the editor of *THE GUIDE TO NATURE*, he says:

"I do not eat our grapes, or plums, or pears and rarely a raw apple. I eat a few ripe peaches and ripe strawberries once a day. Oranges and grapefruit do me more harm than good. With cooked fruit I fare better. I can eat baked apples three times a day. The one raw fruit that is medicine to me is the tree melon or papaya of the Hawaiian Islands."

We shall be glad to learn from others, especially of our elderly readers, as to whether their experiences coincide with this of the Dean of Naturalists.



TO KNOW THE STARRY HEAVENS

Contributions to the Observatory.

Mr. J. R. de la Torre Bueno, White Plains, N. Y.....	\$ 1.00
Mr. Frederick A. Hubbard, Green- wich	1.00
Mr. Irving Bacheller, Riverside, Conn.	10.00
Mrs. John Elbert White, Green- wich	1.00
A Friend (Increase—total \$4.00) ..	2.00
Mr. Fred C. Binney, Sound Beach. .	5.00
Mr. J. D. Sawyer, New York City .	2.00
Mr. S. M. Boschnogel, Saunders- burg, Penn.	1.00
Mr. J. K. Lawrence, Stamford....	2.00
Mr. E. N. Fast, Stamford.....	1.00
Mr. Geo. W. Lockwood, Stamford .	1.00
Mr. B. Frank Finney, Greenwich..	1.00
Miss Frances H. Errett, Newtown, Ohio	25.00
Brady & Chadeayne, Stamford....	5.00
Mr. George Lauder, Jr., Greenwich	25.00
Mr. Charles H. Knapp, Sound Beach	10.00
Mr. Chas. O. Trowbridge, Fram- ingham Center, Mass.....	1.00
Mr. Arthur L. DeGroff, Newark, N. J.	25.00
Mrs. R. G. Hinton, Hartford, Conn.	1.00
Mr. Walter F. Mortimer, Sound Beach	2.00
Mr. M. G. Allyn, Riverside, Conn.	1.00
Mr. S. C. Hunter, New Rochelle, N. Y.....	50.00
Mr. Samuel Phillips, Stamford... .	1.00
Mrs. Grace Lee Smidt, Sound Beach	10.00
Miss Sarah Root Adams, Portland, Maine20
Total	\$184.20
Previously acknowledged	322.00
Grand Total	\$506.20

The Starry Heavens in August.

BY PROF. ERIC DOOLITTLE OF THE UNI-
VERSITY OF PENNSYLVANIA.

DOUBTLESS the most interesting astronomical occurrence of the present month is the entrance of the beautiful planet Jupiter into our evening sky. If during the last few weeks the reader has happened to glance at a late hour of the evening toward the eastern heavens, he cannot have failed to notice this most brilliant object there, well up from the ground, and shining with sixteen times the brightness of a first magnitude star. But not until the first of the present month does this most wonderful and interesting world—by far the largest of all the worlds which circle around our sun—enter the borders of our evening sky map. For the remainder of the present year it will remain the most conspicuous object in the evening heavens.

This month is also signalized by the passage of the moon over the bright star Antares and by the occurrence of an eclipse of the sun, but unfortunately neither of these interesting phenomena will be visible to observers within the borders of the United States.

THE AUGUST STARS.

There have been many interesting changes in the face of the evening heavens since last month. The great Leo, the very last of the winter groups, has disappeared; the preceding stars of the very large group, Virgo, are beginning to set, and there no longer remains the least trace of the long, straggling constellation known as the Water Snake. Hercules and Corona no longer occupy the highest point of the heavens, but they, as well as the brilliant Scorpio, Ophiuchus and Bootes, have moved far toward the west. The long train of bright groups along the Milky Way are now all near the meridian, while Aquarius, the beautiful Andromeda and the

Great Square of Pegasus have all appeared in the east.

A very beautiful region for exploration and study is that which lies within the borders of the constellation Cygnus, or the Northern Cross, now high in the evening sky. The star at A is perhaps the most beautiful double star in the heavens with a small aperture, the large-

which, from the immense amount of mathematical research which has been devoted to it, is well known to every astronomer. This pair is called "Sixty-one Cygni" and has the distinction of being nearer to us than any other known star north of the Celestial Equator. The light from this pair of suns requires but eight years to reach us, so that Sixty-



Figure 1 The Constellations on August 1 at 9 P. M.

(If facing south, hold the map upright; if facing East hold east below; if facing west, hold West below; if facing north, hold the map inverted.)

er star being of a golden color and the smaller one blue. The star at C is a very similar but more difficult double, while that at D is a double presenting an only slightly less beautiful contrast in color, but in which the colors are far more unusual, the larger star being white and the smaller one of a lilac tint. If there are any worlds in this strange system, the dwellers upon them thus see a white sun and a lilac sun rise every day; in fact, it might always be day on so strangely situated a world, because, perhaps, one of their suns is always to be seen in their sky.

At the position E there is an inconspicuous sixth magnitude pair of suns

one Cygni is at almost exactly the same distance away as the bright Dog star Sirius.

The variable star at B, which the reader may have noticed when it was a bright, naked-eye object, is now of nearly the eleventh magnitude and is daily growing fainter. This strange sun thus oscillates from brightness to faintness continually, the period being 406 days; though for some cause, as unknown to us as the cause of the variability itself, this period has recently been growing longer.

Around the star at F there is a wonderful stream of stars, while between this and the star at H is the curious va-

cant region of the Milky Way known as the Northern Coal Sack. But star streams and clouds and other wonderful objects literally fill this beautiful region of the Milky Way. The bright star at H is itself a most interesting sun. Not only do we now see it as the brightest star of the constellation, but it is ap-

moon, while to those within the narrow strip MNO, the intensely black disc of the moon will appear to move completely on to the bright disc of the sun. Even here, however, the sun's light will at no time be completely cut off; it will shine out as a brilliant ring encircling the ball of the moon. It is for this

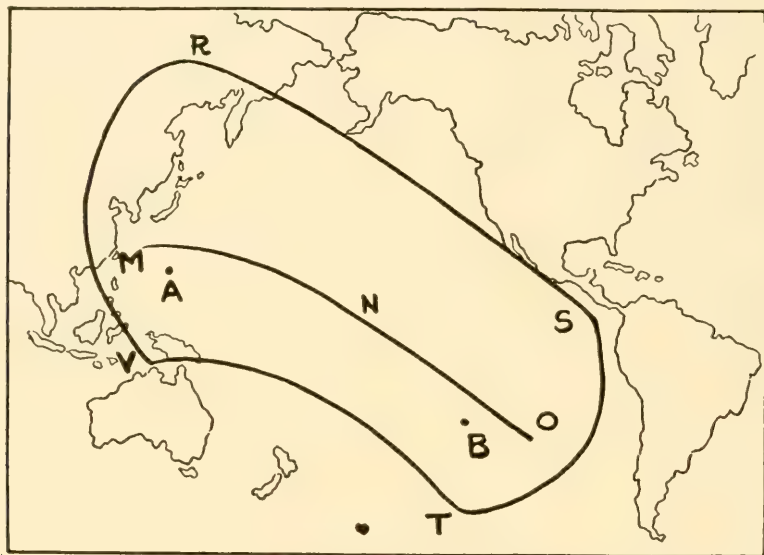


Figure 2. Regions of the earth from which the eclipse of August 10 is visible.

proaching our earth at the rate of thirty-six miles a second, and in the course of very many centuries it will have drawn so near us that it will far outshine every other star of the heavens. What kinds of beings they will be who will then be watching the heavens from our little earth we can only conjecture, if indeed our world at that remote epoch will be in such a condition that any life at all will be possible upon it.

THE ANNULAR ECLIPSE OF THE SUN.

On the afternoon of August 10 the moon will pass between the earth and the sun, but unfortunately the shadow of our satellite will not at that time fall upon any part of the United States. Were there an observer at the point A, Figure 2, he would be the first person on the earth to see the moon's black disc touch the edge of the sun; while it is from the point B that the last trace of the eclipse will be visible.

All observers within the region RST V will see the sun partly hidden by the

reason that eclipses of this kind are called Annular, or Ring, eclipses.

The present eclipse will begin on August 10 at 2 hours 56 minutes 6 seconds, P. M. (Eastern standard time) and will end at 8 hours 48 minutes P. M., thus lasting in its entirety almost six hours.

THE PLANETS IN AUGUST.

Mercury enters the evening sky on August 14, but does not reach its greatest distance east of the sun until September 27. On August 31 it sets about one hour after sunset and may therefore be then detected low in the twilight; but it can be seen to much better advantage four weeks later.

Venus is practically invisible throughout all of August, as it is lost in the rays of the sun. On August 1 it rises but forty minutes, and on August 31 but ten minutes before sunrise.

Mars will be seen rising far in the northeast, four hours before sunrise; it thus attains a quite high altitude by the time of dawn. It is now of almost exactly the same brightness as a first magnitude star; because of this, and because

of its red color, it is very conspicuous and cannot be mistaken.

Jupiter may be seen rising almost exactly at the east point of the horizon at 9 P. M. on August 1 and at a few minutes before 7 P. M. on August

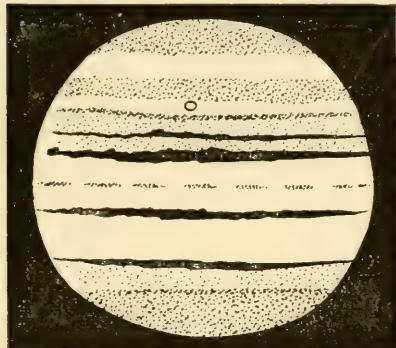


Figure 3. A recent drawing of the planet Jupiter made with a large telescope. The flattening of the planet at the poles is very evident in this drawing.

31. Though this world, on the whole, moves eastward among the stars, completing the circuit of the heavens in about twelve years, it is at the present time moving slowly westward or "retrograding." This retrograde motion will continue until November 15, when it will be found at a distance equal to seventeen times the apparent diameter of the full moon west of its present position. After this date it will again run rapidly eastward among the stars.

No planet affords a more interesting subject for study with a small telescope than does this one. Its delicately colored bands and its markings, which are continually changing both on account of the great disturbances on this vaporous world and on account of its rapid rotation, and its four bright and ever-moving moons form so fascinating an object that one can scarcely tire of watching it. Numerous occultations, transits or eclipses of the moons will be seen to occur during the nights of August 6, 8, 15, 22 and 31.

Saturn is steadily withdrawing from the sun's rays into the morning sky. On August 1 it rises, but two hours before sunrise, but this time is increased to no less than four and three-fourths hours by the end of the month. It will not be until November, however, that we will see this beautiful planet shining in our evening sky.

A Sonnet.

Mysterious night! when our first parent knew
Thee from report divine, and heard thy
name,

Did he not tremble for his lovely frame,
This glorious canopy of light and blue?
Yet 'neath a curtain of translucent dew,
Bathed in the rays of the great setting flame,
Hesperus with the Host of Heaven came,
And lo! creation widen'd in man's view.
Who could have thought such darkness lay
conceal'd

Within thy beams, O Sun! or who could find,
Whilst fly and leaf and insect stood re-
veal'd;

That to such countless orbs thou mad'st us
blind?

Why do we then shun death, with anxious
strife?

If light can thus deceive, wherefore not life?
—Joseph Blanco White.

Dr. Edward F. Bigelow, over at Sound Beach, is trying to buy a telescope for ARCADIA, so we can all look up into the sky and see what is going on so far away. While there is a good deal of room up in the sky for one small spy-glass to look at we hope the Doctor gets his observatory. It is nice to know a lot if you can acquire knowledge by merely looking at it instead of reading and studying, which is hard on the occiput. —"Cos Cob Nature Notes."—*New York World*.

A late report from the Lowell Observatory at Flagstaff, Arizona, states that the only water on Mars is that furnished by the melting snow of the polar ice caps. The equatorial region, therefore, is excessively dry. The latest measurement of the amount of oxygen present in the Martian atmosphere shows it to be about one-half that of the earth's.

A German naturalist notes that some of the common shore crabs lifted by the shell between thumb and finger and waved in the air, become rigid and are probably hypnotized.

A recent study by Crocker and Groves of the duration of life in seeds appears to show that death is due to a slow coagulation of the proteins. The rate at which this takes place is the more rapid the higher the temperature and the greater the amount of moisture in the seed. One hundred and fifty years seems to be the limit of longevity for the most resistant seeds under the most favorable conditions.



Our Meriden, Connecticut, Chapter.

The annual reports from this Chapter come to us in excellent shape, not in glittering generalities, but in a specific account from each member as to what was actually studied. For example, we quote a little from a few of these extended, individual reports.

Mildred Whiting tells how she went into the woods searching for cocoons and finally found one on a white birch tree. "This cocoon was made out of leaves and fastened to the twig of the tree. I cut the twig and procured the cocoon. Then I took a box, cut out the top of the cover, inserted some netting, put the cocoon in the box, and put this cover on. I also gathered about six of these common brown caterpillars and put them in the same kind of a box as I did the cocoon. I fed them grass and leaves, mostly rose leaves. Within three days, they had all spun a cocoon for themselves. They all seemed to prefer the corner of the box, so that there were two or three in one corner."

Caroline J. Hitchcock: "The subject I chose for my work last year was plants. During a visit to the British Isles I collected and pressed specimens. This fall I mounted these and I now have to give to the society about fifty specimens and of these eleven are ferns. The ferns have their botanical name with them but the others have not."

Eva Rettenmeyer tells how she became interested in astronomy and continued that study: "As far back as I can remember I have felt a friendly interest in the stars. Although there were brighter and more attractive groups in the heavens, the seven stars of the Big Dipper received most of my attention. The reason was simple enough—I knew the group by name. Because of this I made a firm resolu-

tion to learn the names of as many stars as possible. But how? Occasionally one had been pointed out to me, but when I looked for it again, it was lost among the many.

"With a great deal of doubt in my mind, I turned to books for help. At first I found them, as I had expected, too technical, until at length one appeared which professed itself a guide for the amateur. This I read and re-read during the day and then impatiently awaited night and my old friend, Ursa Major.

"With the aid of the 'Pointers' I found the Pole Star and the other stars making Ursa Minor. By tracing imaginary lines from these two constellations I located Cassiopeia and then Capella and Vega and, soon after, the most beautiful star of all, Arcturus. And so I continued the study, each night finding some further from the North Pole until I could recognize most of the southern constellations.

"By this time, newer constellations began to appear in the east. It was ever so interesting to watch the stars rise, one by one, first late at night and then earlier and earlier until they were visible soon after sunset.

"Meanwhile some of my first star acquaintances left the evening skies. Now they are returning and others are setting. It is a continual going and coming which keeps our interest balanced between the east and west.

"As I have shown, my first step in astronomy was to learn the names of the brightest stars and of the constellations to which they belonged. This I could not do without noticing and reading about various phenomena. I noticed the different degrees of brightness and this led to the reading of paragraphs on magnitudes, size, and distance. I marked the differences in

colour and the different tone of the same star when rising or setting. Of these, also, the book held explanations. I saw double stars and read about them, and in one glorious moment, through a telescope, I saw the trapezium of Orion. In that same moment I realized, from the quickness with which the telescope got out of field, how rapidly the earth is revolving. The different positions of Ursa Major had previously proved it to me.

"These are but a few of the interesting points in the study of astronomy. It contains everything from the most poetic traditions to the greatest of scientific investigations.

"So far I have tried to gain a little general knowledge of astronomy in different phases. Perhaps in another season I shall be content to concentrate upon the study of some particular phase of it; at least, I hope to."

Adelaide Piechocki gives a list of minerals that she has studied, also continuing an interest in moths and butterflies. The list of minerals contains many of especial interest with description of what has been learned.

Gertrude Henrietta Rudolph has studied and mounted eighteen kinds of plants and found the work delightful. She is continuing it this summer. She also reports having given considerable time to birds and insects on her walks searching for plants.

E. Norma Doolittle has studied trees and astronomy. She says that she secured a planisphere and some books and in a short time was able to recognize principal stars as well as constellations. During her study she was fortunate in having a view through a large telescope. She saw Saturn, the stars of the Pleiades, and has become much interested in Mercury.

Ellena Risley McLean says she arranged a collection of thirty-five different tree seeds in uniform bottles and labeled. "I have five blocks of wood cut to show the grain. The evergreens look well in the Rikers' mounts and I have branches of the white pine, arbor vitae, and Norway spruce, with cones from each, thus arranged. I also have a photograph of each tree which I shall fasten in an envelope to the back of the mount."

Louis C. Dossin collected the cocoons of moths in the winter and gives quite a long list telling various experiences with each particular kind. In the spring he caught moths under the electric lights but found that the most perfect imagoes were those that came out of cocoons collected during the winter months.

W. G. Shute gave extended attention to geology and writes interestingly as follows: "A few years ago Professors Rice and Gregory explained the geological changes to which Connecticut and therefore Meriden were subjected. During the past summer I attempted to cover Meriden and the vicinity in order to explain the nature of our hills and mountains in the light of the work prepared by the gentlemen mentioned.

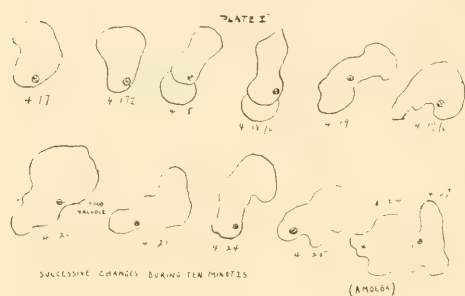
"I visited first Roaring Brook in Southington where I took a picture of the Paleozoic schists at right angles to the overhanging sandstones. I later found outcrops of gneiss east of Middletown thereby easily proving that Meriden was formerly under water, with high mountains on either side. The four separate strata of sandstone were easily followed with their intervening lava sheets, namely the anterior, main and the posterior. The last was not found in Meriden. The first was interesting for it bore the marks of a lava deposit into water. One frightful explosion of steam and stone was found in the 'crater' near Berlin. Furthermore, the sandstones by their decidedly red color denote that they were deposited in fresh water. This shows that Meriden was at least twice under water. The age of the strata is easily determined by the many imprints of the dinosaur, a semibipedal reptile, which lived during the Triassic or early Jurassic era.

"The last changes were explained by the ice sheet's sweep across the state. I took many photographs illustrating the different formations caused by the glaciers and attempted to explain the nature of all our hills. The whole attempt of my work was to picture as clearly as possible the different stages through which Meriden had passed."

Anna Koffinke tells of "Amoebae I Have Watched" as follows: "My mind was strangely divided in my choice of a special subject between astronomy,

the largest, most infinite of all sciences, and the study of amoebae, the lowest forms of animal life, too tiny to be seen by the naked eye, though thousands be in a drop of water.

"Microscopes have an interest second



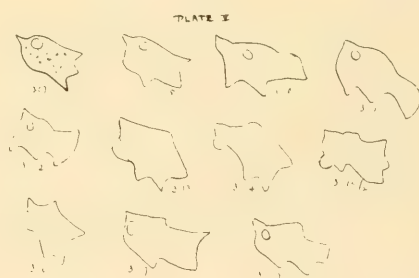
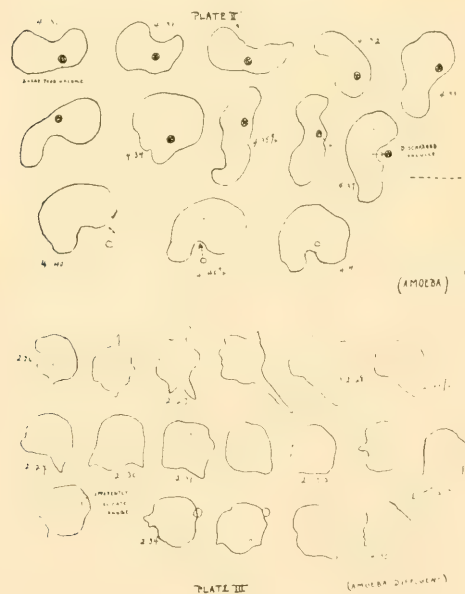
only to a telescope, and each glance brings a new surprise. And so, with a different specimen occasionally, but almost invariably the amoeba shown on Plate I, I spent a few afternoons watching their movements and record-

ing them each minute or each half-minute.

"The amoeba shown on Plate I changed rapidly and was very active whenever I observed it; it appears, however, that amoebae have their periods of activity and of rest, according to a pamphlet written by Dr. Gibbs and other gentlemen who made a special study of one specimen. I have never seen it take any food excepting algae. But as the second plate shows, I had an opportunity to watch the discharge of a food vacuole.

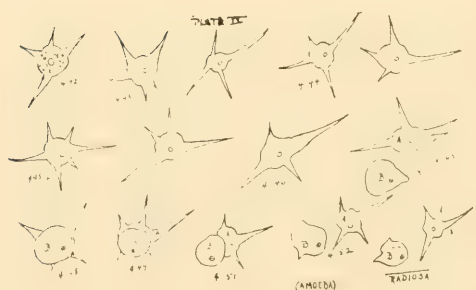
"Plate III shows the *Amoeba diffluens* which is continually thrusting out little projections of its protoplasm, and again contracting.

"By far the most interesting and prettiest of the amoebae which I could find changed even more rapidly than the others. This was the *Amoeba radiosa*, beautiful for its symmetry, for the glass-like appearance of its projections, sharp and pointed like the rays of a star.



"A queer and constantly varying specimen is that on Plate V. I have not been able to find its name. Further than these, the slipper-animalcule and a large, interesting Entomostracus, with an extraordinary amount of activity, and my observations were suddenly interrupted. But the study of amoebae proved so interesting as far as I went, that I shall some day try to make a special study of them."

This Chapter has always kept a high standard of work. It has a special place of work known as The Agassiz Room. Two delegates were sent by the Chapter to visit ARCADIA. We do not know what they reported back to the Chapter but we do know that they gave some very interesting reports of



the Chapter. One commendable feature was the fact that every member has to do something and the rule is even if you have not done anything get up and say so, which makes every one do something.

Trees Gnawed by Beavers.

The accompanying photograph, showing the work of beavers, excels in many

"I am mighty glad to see you, old fellow." The thought of sourness or of cordiality comes before the words. To the writer this is an important pedagogical point. Shall we begin with a thing or with a word if we intend to teach the child to think? I am sure that Agassiz had this in mind when he said, "Study nature, not books."

This question was sent to Professor



A REMARKABLY LARGE TREE ATTACKED BY BEAVERS.

respects all other photographs of beavers that have reached this office, as the trees there shown are the largest that we have known to be attacked by beavers. The one in the background is more than four feet in diameter, the other more than five. They are on Trout Creek, about half a mile from Okanagan Lake in British Columbia, Canada. The photograph was sent by F. H. Van Hise.

Words and Things.

The first line on the first page of a recent number of "Moderator-Topics" reads as follows: "We think in words." That surely causes one to think. Do we really think in words, or are the words secondary as an expression of an aroused thought? I bite an apple. It is sour. I have a thought before I speak the word "sour." I meet a friend and cordially grasp his hand. The thought in itself is complete before I express it in the words,

Hugo Munsterberg, the famous professor of psychology at Cambridge, Massachusetts. He writes in reply as follows:

"You are certainly right in saying that you can think of the actions of a cat, a squirrel, a child, without any words, but the pedagogical magazine which claims that we think in words is certainly right too. The apparent conflict lies in the fact that the word thinking is used there in two entirely different meanings. You use thinking in the sense of having in consciousness, including remembering and selecting parts of the memory picture, even linking new memory pictures and imaginative ideas. The other party uses thinking in the sense of producing thoughts by going from premises to conclusions. In your sense of the word the animals certainly think too; in the other sense of the word, the animals hardly think.

"But it seems to me more important

that both functions deserve training. The study of nature itself is therefore an excellent condition for mental development and is to be recommended as the basis of all scientific interests. Yet when we come to the development of principles based on thought, the thinking in words becomes essential."

The Station for Experimental Evolution at Cold Spring Harbor, Long Island, reports one hundred successive generations of the common water flea (*Daphnia pulex*) without the appearance of any males. Another culture, of a different species, has now reached seventy-six parthenogenetic generations.

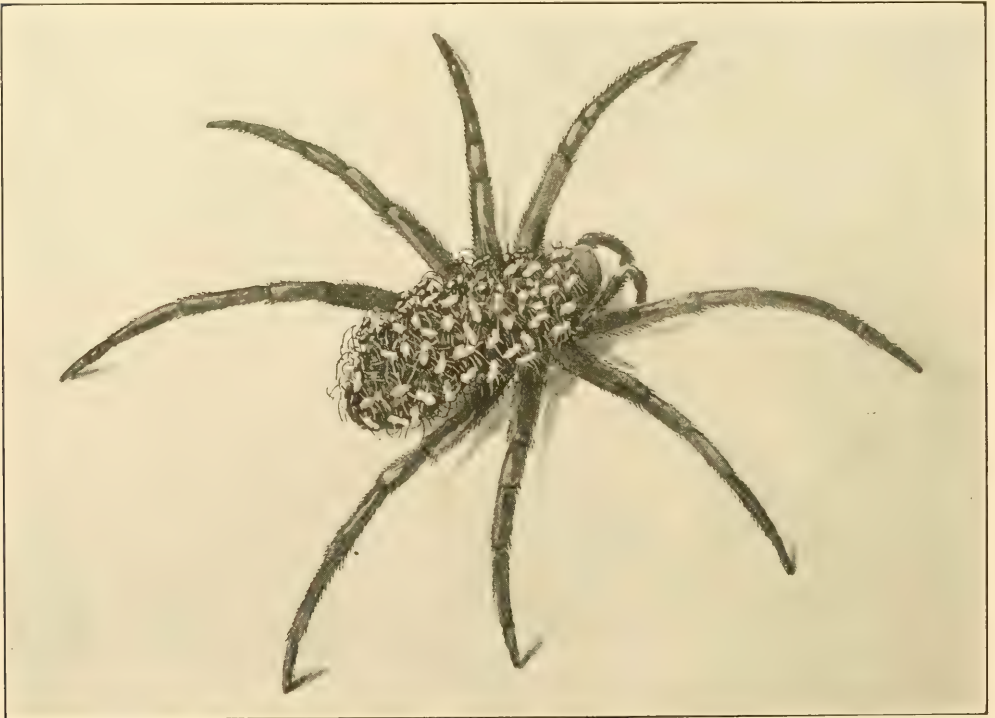
A Spider's Motherly Devotion.

BY W. I. BEECROFT, ADAMS, MASS.

Different creatures have different methods of caring for their young, pro-

Appreciative Words from a Stamford Editor.

The Agassiz Association of Sound Beach appears to be mounting the ladder of pecuniary success so rapidly of late as to make it a potential candidate for the ranks of plutocracy. In the annual financial report just made public, the candid confession is made by President Edward F. Bigelow that during the last year he has been paid the sum of \$708.44 for mechanical and business work on *THE GUIDE TO NATURE*, the official organ of the association, which has provided him with a weekly compensation of \$13.62. In his capacity as president of the association and editor of its magazine, however, he received nothing. The \$13.62 looks prodigious, owing to the monetary void that preceded the latest year, as during the previous seven years Mr.



HOW THE SPIDER CARRIES THE YOUNG.

vided they give them any care. The running spider's habit of carrying the young on the back is a peculiar instance of devotion in a creature so low in the scale of life. In the accompanying illustration the mother spider is thus transporting more than two hundred little ones.

Bigelow's work, mechanical, editorial or any other sort, has gone wholly unrewarded, and he has even paid rent to the association for personal use of the garden and pethouse. Furthermore, three members of the president's family assist in the work of the association without compensation. It would appear,

then, that \$13.62 a week buys a deal of labor and devotion in the interests of an educational enterprise.

The steadily widening orbit of the association's influence and work and the constantly increasing number of its friends and patrons are the best evidence of a growing appreciation of the excellence of its purpose. The association is forty years old this summer, but during the last two years it has been entering on what is described as a "new era of enlarged scope as a public institution." Its object is highly meritorious, as few education excursions are more productive of profit and pleasure than deep researches into the mysteries of nature. In its president the association has a tireless and self-sacrificing official to whom great credit is due for progress already made and a prospective that is particularly promising of greater progress to come.—"The Daily Advocate," Stamford Conn., Friday, June 18, 1915.

Good Work and Good Methods.

Frankford, Philadelphia, Pennsylvania.
To the Editor:

As President of Chapter 1054 I send the following report.

ORDER OF EXERCISES.

1. Meeting called to order by President.
2. Reading of minutes of last meeting by Recording Secretary.
3. Old or unfinished business of the Chapter.
4. New business of the Chapter.
5. Collection of dues.
6. Discussion of nature subjects.
7. Fun.
8. Adjournment.

The meetings are held every two weeks at the houses of the members in alphabetical order. At each meeting the members report on some object of nature that they have seen. The treasurer reports once a month. The dues are two cents every meeting. The number of members is limited to ten.

We have taken several outings. On the first of these we found several arrowheads and saw many birds. This month we are specially searching for birds. We have arranged to look through the large telescope in the observatory at Haverford College.

JOSEPH BORNEMAN.

Come Now; Let Us Reason Together.

It is an astonishing fact that The Agassiz Association has hundreds of members, yes, even thousands if we take into consideration all those that have been enrolled as individual members or as members of Chapters since the organization was first started, that have not yet become subscribers to *THE GUIDE TO NATURE*.

It is also equally astonishing that *THE GUIDE TO NATURE* has hundreds of subscribers that are not members. We may have some on our list that cannot afford to pay a dollar and a half a year, but we are sure that many of our active friends should become members.

Probably some of our readers will be amazed at the statement that we have so many members that are not subscribers, and a large number of subscribers that are not members. But they have no more reason for astonishment than have the workers here in the Home Office. Let us remedy this amazing situation. Every one who receives this magazine at a dollar a year is getting what costs far more, and that difference is made up by our loyal members and appreciative contributors. Let every one who can possibly do so take more cooperative interest in the work than merely by a subscription.

The Naturalist Field Club of the University of Pennsylvania, after some years of inactivity, has been reorganized and has taken on renewed life. The club is now managed entirely by the undergraduates, although graduate students and members of the teaching force are eligible to membership. The zoological laboratory of the University provides a meeting place and a photographic dark room.

C. H. Turner prints in the Biological Bulletin (Lancaster, Pennsylvania) a long account of his elaborate experiments on the hearing of the large silk-moths, polyphemus, cecropia, promethea, etc., together with various other smaller moths. He finds that they all hear, and are affected by a wide range of pitch, from below the lowest note of a piano to above the highest.

A Wide-Awake Chapter.

Monsarrat School, Louisville, Kentucky.
To the Editor:

Since our former letter to you, the Monsarrat Chapter of the AA has had several enjoyable trips. One excursion was to our beautiful Cherokee Park. We started immediately after school and spent the afternoon in searching for plants and hearing wonderful explanations about them.

Many spring flowers were in bloom, such as the wild yellow poppy, the white and the purple violet and the wild hyacinth. The hyacinth was more eagerly sought for than any other plant; the children scrambled over rocks, climbed hills and did almost anything to reach one. But the roots extend so deep into the ground that it is difficult to get them out unbroken and complete, yet nearly all of our plants had the roots, and most of the children transplanted them in their gardens or window boxes. A common plant which interested us was Dutchman's-breeches, another name for squirrel corn. We also got many specimens of jack-in-the-pulpit.

All our trips have been beneficial and we hope that others in the future will be as successful.

We held our final regular meeting of the AA on Thursday, June 10th. This was the last one for many of us as members of the Monsarrat School, since we go to High School next September.

We were pleased to see our letter and pictures in the May number of THE GUIDE TO NATURE. When you said that we have caught the real AA spirit of standing for high ideals and accomplishing things really worth while, you strengthened our desire to keep that standard, not only in nature study but in everything else.

Very sincerely yours,

LETITIA LAWRENCE,
Corresponding Secretary.

The Report of the Larchmont Manor Chapter.

Larchmont, N. Y.

To The Agassiz Association:

Since the members of my schoolroom formed the Larchmont Manor Chapter of The Agassiz Association last June, we have all taken a special interest in the study of nature.

In the autumn we studied the trees and their bark, especially the nut bearing

trees. We also made a special study of the silkworm, the bee and the life history of some moths and butterflies. This spring we raised an exceedingly beautiful Polyphemus moth in our room.

In the spring we studied the buds of trees and shrubs. We also learned much about spring flowers and made a collection.

At the meetings of the AA during the year, we have studied many song birds.

All the pupils of the Manor School were delighted with the interesting lecture that Dr. Bigelow gave us in January on "Roadsides, Fields and Forests." I sincerely hope that we may hear from him again, as he afforded us so much pleasure.

Hoping to go to ARCADIA, the interesting home of the AA, not only next year, but at many other times, I am

Sincerely yours,

ALYS BOROSS,
Corresponding Secretary.

A Collecting Pipette.

Mr. Arthur M. Banta, a member of the staff of the Long Island Station for Experimental Evolution recommends for collecting small, active water creatures a peculiar form of



pipette. The instrument is made from one of the "calcium chloride tubes" sold by dealers in chemical supplies, and is worked by means of a common rubber bulb two inches or so in diameter.

These tubes come in various sizes. A convenient sort will be seven or eight inches long and have a bulb an inch and a half across, with a tube about half this dimension. The wide open end of the tube will, of course, have to be heated and drawn down to the required size for the pipette mouth.

Because of the large capacity of this type of pipette, there is little danger of drawing a specimen into the rubber bulb, its shortness makes it easier to carry in the pocket than the ordinary long form, it is far more nimble than a net, and less likely to injure delicate specimens or itself come to grief.

"The Forest of Arden" at Sound Beach.

One hundred acres of forest land, as wild, primitive and picturesque as it was in the days of the Indians, have had their natural history attractions added to those of ARCADIA. Mr. Cyrus C. Miller of Miller & Bretzfelder, Counselors at Law, No. 55 Liberty Street, New York, has placed his extensive forest, so far as its nature interests are concerned, at the disposal of the Agassiz Association. He will hereafter allow this wild and beautiful tract to be known as "The Forest of Arden." He writes as follows under date of May 17:

"I have no objection to your calling it 'The Forest of Arden' if you wish, but I presume such names, to be lasting, must be adopted by the community. I have refrained for a long time from posting signs on the property forbidding trespassing, as I like to have the people of the neighborhood exercise the privilege of rambling over the property and enjoy the woods and fields, but I found it necessary to warn people generally to keep away, as they knocked down and took away the fences and gates and even cut down the trees. It is to be regretted that they could not enjoy the woods and fields without destroying fences, shrubbery and trees. If the people of the neighborhood would take it upon themselves to prevent such vandalism I should be very glad to have them do so and to enjoy the natural delights of the place."

Mr. Miller desires to keep this tract of land in its present primitive state. In a later letter he writes: "I have withstood the temptations of fellows who wished to buy the trees to cut down, and it was a matter of regret to me when the chestnuts were blighted so they had to be destroyed. I do not like to see even a single tree injured. There are not many pieces of woods left now-a-days near the big cities so that we can destroy one lightly."

It would be difficult to find a more easily accessible or picturesque forest than this. It is within six minutes' walk of ARCADIA. Many visitors and students have been taken there to examine the trees, the plants, the insects, the birds and among other things the various phases of aquatic microscopy. Every one interested in nature study will commend the selection and the appropriateness of the name "The Forest of Arden,"

an idyllic place of enjoyment in nearness to nature. It will form an acceptable adjunct to our present equipment for nature study. Of course everybody knows that the Forest of Arden was made famous by Shakespeare's play, "As You Like It." What could be more fitting than a name from such a play? What one gets out of nature depends entirely upon how it is liked. "We love things not because they are beautiful but they are beautiful because we love them." Shakespeare fittingly portrayed the valuable knowledge we may obtain from "The Forest of Arden" when he refers to the common myth that a toad, though erroneously regarded in those days as ugly and venomous, "Wears yet a precious jewel in his head." The myth of the toad applies well to all phases of nature. Often a swamp may seem very commonplace or even ugly and forbidding, and yet if one searches faithfully into the near recesses of things there will be found many "jewels" or good things. Shakespeare sums up the value of "The Forest of Arden" in these classic words:

"And this our life, exempt from public haunt,
Finds tongues in trees, books in the running
brooks,
Sermons in stones, and good in every thing."

It will be remembered by the readers of "As You Like It" that Orlando was of poetic, sentimental tendency, and that Adam, an old fellow, who lived near to nature, thus describes himself:

"Though I look old, yet I am strong and lusty;
For in my youth I never did apply
Hot and rebellious liquors in my blood;
Nor did not with unbashful forehead woo
The means of weakness and debility:
Therefore my age is as a lusty winter,
Frosty, but kindly."

That was a pretty good combination for exploring "The Forest of Arden" and the result was that Orlando saw the poetical commonplace trees and expressed his love by hanging poems thereupon. They were only ordinary trees, just such trees as may be found in this Sound Beach "Forest of Arden," but looked at with the heart of love they became permeated with beautiful thoughts. Thus the elderly people of kindly heart will enter "The Forest of Arden" fittingly accompanied by the poetic, youthful enthusiasm of the young people.

Gathering the Soap Plant.

BY BESSIE L. PUTNAM, CONNEAUT LAKE,
PENNSYLVANIA.

A new industry has sprung up in some parts of the West, and the gathering of a species of *Yucca* at from five to eight dollars per ton may add to the farmer's income, and at the same time free his fields from a troublesome weed. The plant belongs to the lily family. Its leaves yield a fibre useful for several purposes. The fruit, similar in shape to a banana, was highly relished by the Indians. The establishment of the new factory to convert the plant into a soap, said to be free from alkali, and especially useful as a toilet soap and for washing woolen goods, is but another illustration of the fact that new uses are continually being found for what were once considered waste products.

This however is not the only soap plant which nature has given us. In California is another bulbous plant, the outer husks of which are used to fill cushions or mattresses, and the inner portion to make a fine lather for laundry purposes. Peru, Spain, Egypt and other countries have each its representative soap plant, some of these belonging to widely different families.

Do Lobsters Suffer?

Humane people have for a long time protested against the cruelty of fishermen, because of their custom of boiling lobsters and crabs slowly, instead of plunging them into water boiling hot, and thus ending the agonies of the creatures quickly. It seems, however, that the fisherman's way was the most humane way, after all.

The New Jersey Society for the Prevention of Cruelty to Animals asked Mr. Joseph Sinel, late of the New Jersey Marine Biological Laboratory, to test the matter by a series of experiments. The result showed, according to Mr. Sinel, that lobsters, placed in cold water, gradually brought to a boiling point, exhibited no signs of discomfort. When the water reached seventy degrees, they became comatose, and they died at about eighty degrees. On the contrary, lobsters placed in boiling water made violent efforts to escape and did not die for about two minutes.

Mr. Sinel compares the death of a lobster by gradual boiling, to that of a person succumbing to a "heat wave"; it suffers a gradual loss of consciousness and a painless end—The Youth's Companion.



A SECTION OF A BED OF POPPIES.

Grown at Joseph F. Whittaker's, 143 Washington Avenue, Stamford, Connecticut; from seed sent by a friend in California.

PUBLISHER'S NOTICES

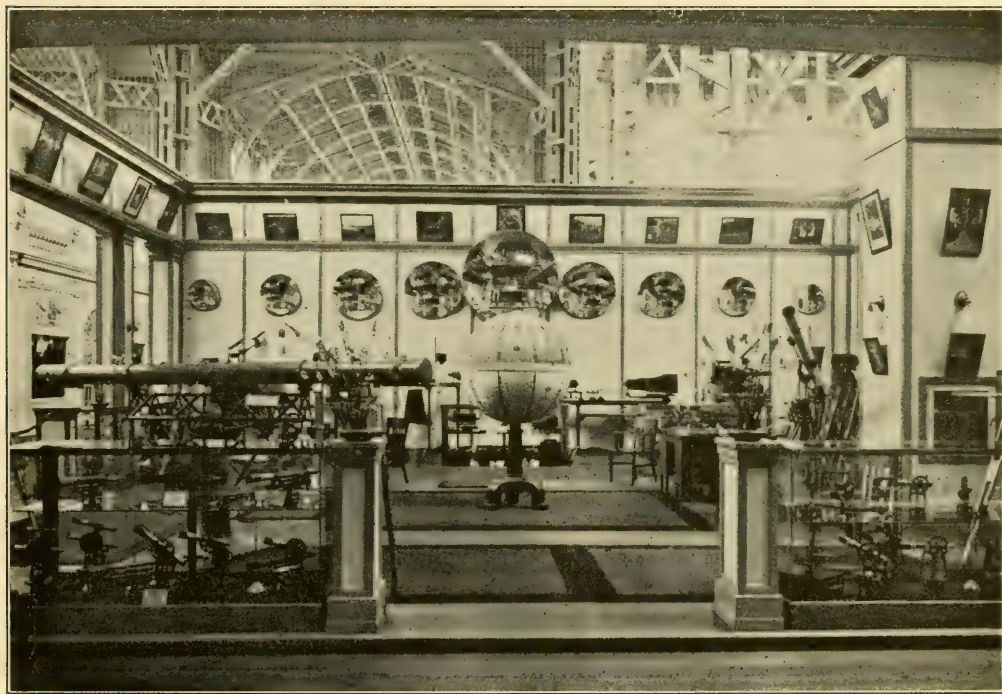
'Tis not in mortals to COMMAND success, but we'll do more, Sempronius, we'll DESERVE IT.

—Addison: Cato.

Remarkable Effects in Illumination.

The illumination at the Panama-Pacific Exposition in San Francisco, over which so many visitors have gone into ecstasies, depends to a great extent upon powerful searchlights and reflectors made by the Bausch & Lomb Optical Co of Rochester, New York.

ace of Horticulture, said to be the largest structure of glass in the world. It is illuminated with twelve thirty-six-inch searchlights which direct the light upon the great globe of glass while revolving disks cause an ever-changing procession of colors to follow each other across the dome.



THE EXHIBIT OF THE BAUSCH & LOMB OPTICAL COMPANY AT THE PANAMA EXPOSITION.

The great Tower of Jewels, the dominant feature of the illuminating system, furnishes the most striking effect of the searchlights. The 125,000 cut glass prisms, with which the structure is hung, reflect all the colors of the rainbow under the searchlights' rays.

Another feature for which a large order was placed with the Bausch & Lomb Company is the illumination of the Pal-

The order placed with the Bausch & Lomb Optical Company called for 450 twelve-inch spherical mirrors, 200 eighteen, and 25 thirty-inch parabolic, and 48 mirrors of the twenty-six-inch (three-foot) size—a total of 723 mirrors. Parabolic mirrors are not like an ordinary mirror. In shape they resemble the pointed end of an egg. They must be accurately ground and polished,

no small task when the mirror is of large size, such as the sixty-inch, five feet across the opening. The total value of the mirrors supplied to the Exposition is nearly \$50,000.

In addition to the mirrors, the company supplied 325 cylindrical diverging glass fronts for use in the doors of the searchlight. Projected through these special fronts, the beam of light in each becomes divergent and thus more spectacular in its illuminating effect.

At the entrance of the yacht harbor is a great battery of searchlights called the "Scintillator," which in effect reproduces the aurora borealis as seen in the far north—a procession of colored lights extending across the sky almost from horizon to horizon and spreading for miles in every direction. This battery has a combined total of 2,600,000,000-candle power.

The exhibit of the Bausch & Lomb Company in the Palace of Liberal Arts is of interest to professional men of all classes and to the public generally for the variety of scientific instruments on display. This includes microscopes, engineering instruments, balopticons (or projecting lanterns), photographic lenses, photomicrographic apparatus, equatorial telescopes, stereo prism binoculars and laboratory equipment. The walls are hung with a collection of photographs shown as examples of the work done with Bausch & Lomb-Zeiss photographic lenses.

In the center of the exhibit is a ball nearly fifteen feet in circumference, decorated with thousands of lenses of different colors which are used in eyeglasses and spectacles. The ball is made to revolve by an electric motor in the base. Around the middle of the ball is a strip carrying the inscription, "Bausch & Lomb Optical Company, Rochester, N. Y.," set in silvered lenses, not one of which is more than one-quarter inch in diameter.

Recent estimates show that dust from the western deserts is being blown into the Mississippi Valley faster than the river and its tributaries are carrying rock-waste to the sea; with the result that the great central valley of the continent, instead of being still farther excavated, is actually filling up.

An Ideal Pencil.

We have tried many kinds of pencils with many experiences and many unsatisfactory experiences. These trials remind me of what I was told when I inquired about the hotels in a small village: "Try either one and you will be sorry that you did not try the other." This may often and truthfully be said of the pencils in a miscellaneous assortment. But the Mikado, made by the Eagle Pencil Company, is a neat pencil, agreeable to hold and look at and pleasing to use.

The Joke with a Double Laugh.

A cigar salesman in the lobby of a hotel, intending to be generous toward his fellow guests and also to do a little advertising, passed cigars. Among the guests were an American comedian and an Englishman. The salesman enthusiastically said: "I am selling these cigars and anyone who smokes three thousand of them gets a grand piano." The smokers puffed away in silence for a minute or so. Then the comedian, curling upward a beautiful ring of smoke, inquired: "Did I understand you to say that if anybody smokes three thousand of these cigars he will get a grand piano?" "Yes, and a pretty good piano it is." Another period of silence and two or three more puffs by the comedian.

Then said the actor: "I think there must be a mistake somewhere. If any one smokes three thousand of these cigars it is not a piano that he will need but a harp." Hearty laughter from everybody except the Englishman, who smoked on in silence.

About an hour afterwards he burst out in uproarious laughter as only an Englishman can laugh. Then to the comedian he said "I hope you will excuse me for not laughing at your first-rate joke. I did not at once see the point but now I understand it. A friend has just told me that you are a funny man on the stage and—of course I was stupid not to see the joke. You could not take a piano around with you from place to place. The harp would be much better for transportation."

Then everybody else laughed, but it is doubted whether the Englishman has yet discovered the cause of that laugh.

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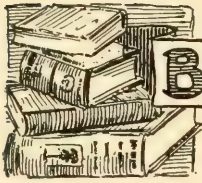
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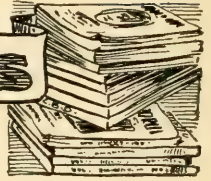
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BOOKS and MAGAZINES



YORK STATE RURAL PROBLEMS. II. By L. H. Bailey. Albany: J. B. Lyon Company.

Every lover of the out of doors will hail with delight this collection of Professor Bailey's addresses to various companies of students, farmers, and others. He speaks clearly and effectively on many aspects of the farm and of life in the country.

MONEY TALKS. By Eleanor Baldwin. Holyoke, Mass.: The Elizabeth Towne Company.

This is the New Thought on money, what money really is, what the function of money really is, what money must have through which to perform that function, and how these three may be applied to solve the problems of our present conditions. "Money will master mankind until mankind masters money," says the author.

SPENCER FULLERTON BAIRD: A Biography. By William Healey Dall, A. M., D. Sc. Philadelphia: J. B. Lippincott Company.

Natural history in America is most of all indebted to two remarkable men, Professor Louis Agassiz and Professor Spencer F. Baird.

Their activities in a public sense in this country began about the same time, Agassiz, the enthusiastic inspiring teacher, and Baird, the efficient, hard-working and lovable organizer, complemented each other.

Professor Baird was a born naturalist and organizer of methods and men. His biography is not a history of explorations nor a record of technical investigations; but an account of the life and relation to them of a singularly eminent, able, efficient and modest devotee of the natural sciences.

Apart from the scientific side of the activities it endeavors to make the reader acquainted with the characteristics of a pure and lovable leader of men to whose modesty and self-sacrifice the country owes a debt which is still appreciated only by a select few.

HANDBOOK OF MEDICAL ENTOMOLOGY. By Wm. A. Riley, Ph. D., and O. A. Johannsen, Ph. D. Ithaca, New York: The Comstock Publishing Company.

This work treats of poisonous and parasitic insects and their allies, and especially of those which transmit and disseminate disease. It is fully illustrated and contains keys for determining the principal species noxious to man. An extended bibliography, alphabetically arranged adds greatly to the value of the work.

The "Handbook of Medical Entomology" will prove invaluable for medical men, students of entomology and to all interested in public health questions.

THE WELL-CONSIDERED GARDEN. By Mrs. Francis King. New York: Charles Scribner's Sons.

This volume by the president of The Women's National Agricultural and Horticultural Association contains the results of a large gardening experience set forth with that "knowledge, insight, and splendid enthusiasm" which, as Miss Jekyll writes in the preface she contributes, "combine to make her one of those most fitted to direct energy, to suggest and instruct." Harmony in color and design may be said to be Mrs. King's central theme, but there are few aspects of gardening problems which she does not touch informingly.

A FIELD BOOK OF STARS. By William Tyler Olcott. New York City: G. P. Putnam's Sons.

To facilitate the fascinating recreation of star gazing, the author has designed this field book. All matters of a technical or theoretical nature have been omitted. Only what the reader can observe with the naked eye or with an opera glass have been included in it. Simplicity and brevity have been aimed at, the main idea being that whatever is bulky or verbose is a hindrance rather than a help when one is engaged in the observation of the heavens.

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(PAGE 118)

IT IS EDITED
BY HARRY G. HIGBEE

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THE HEARTY COOPERATION OF ALL BIRD
LOVERS IS CORDIALLY INVITED

Vol. VIII
No. 4

September 1915

EDWARD F. BIGELOW
MANAGING EDITOR

Subscription, \$1.00 a Year. Single Copies, 10 Cents

GREENWICH

THE EDITION DE LUXE
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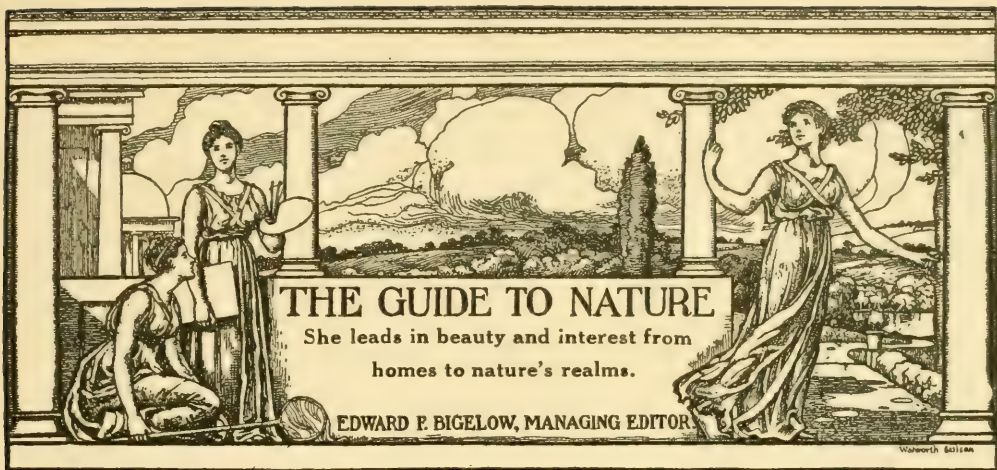
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Volume VIII

SEPTEMBER.

Number 4

A Naturalist Who Considers Many Subjects

By EDWARD F. BIGELOW, ARCADIA: Sound Beach, Connecticut

OUR readers know him as a naturalist, the medical profession and many patients as a skillful surgeon, hundreds of students as "Professor," and all Stamford as a suburbanite—a real "back to nature" resident on a rat farm. But we now have the surprising pleasure of knowing him as Robert T. Morris, the Philosopher.

I say advisedly "surprising," since even he must be surprised, because it all came about in so sudden and yet so natural a way. Like Europe in the present war, he exploded because he was loaded, but with what effect perhaps even this firer of philosophical broadsides did not even himself anticipate. That came as the Deacon's one hoss shay went—all at once and nothing first. He has filled three books with many good things by saying much in few words.

His three large volumes of philosophy have been published by Doubleday, Page & Company under the general title of "To-morrow's Topics." They are "A Surgeon's Philosophy," "Microbes and Men" and "Doctors Versus Folks."

It seems hardly possible that these are by the author of Dr. Morris's medical books, and they are far, far away from

the charming retrospect of his boyhood at "Hopkins's Pond." They are totally unlike him as previously known and totally unlike the books of any one else. They begin a new era in literature. In these days we seek new things and here we find them. The public is getting tired of the short story which represents "your thinking done by some one else."

According to the old regime we associated the idea of science with Tyndall, the idea of humor with Dickens, the idea of beauty with Stevenson. An author whose *leitmotif* is new science, and who presents it in an atmosphere of humor and of beauty, is unquestionably opening as original a line of cleavage in literature as Thompson Seton found with his addition of the human element to the subject of wild life.

The publishers tell us that they believe the time is ripe for a return to the short essay which stimulates controversy and activity of thought. These books are the right kind published at the right time to turn the mind of the reading public toward a new field.

The hack reviewer will not like them. They are for the critic who is looking for something new in literature and com-



THE FARMHOUSE AT MERRIBROOKE HAS BEEN HALLOWED BY "TO-MORROW'S TOPICS." The elevated sleeping porch is shown at the left of the illustration. Here Dr. Morris is lulled to sleep by the melody of the Mianus River in its rapids at the foot of the garden only about two rods away. He is awakened by the music of the birds in the edge of the forest.

plains because he has difficulty in finding it. Agree with all that he says? No. And the author evidently does not intend that you shall. This is the charming part. Complete acquiescence will not arouse thought as these chapters arouse it. Some reader will spring from his chair and walk the floor exclaiming, "That man makes me think as I never thought before," and some mystics, some morbid musicians and painters, will be disposed to swing the battle ax and let loose the dogs of war. But the books will be read more ten years from now than they will be this year. They are not passing books like popular novels but something that will go into permanent literature. The point of view is not merely for the present but literally of "to-morrow's topics." The thinker in advance of his day will especially enjoy them.

But how did he do it all? Why so astonishing, literally so extraordinary an explosion of a series of mines loaded with so many incongruous subjects? These never came from a Madison Avenue office, nor an easy chair, nor from

the haunts of busy men. They come from wild nature. The author's philosophy makes us think not of medication but of meditation. Only in its incisiveness is it surgical, but true to the surgeon it is curative of many of humanity's ills.

Like Thoreau at Walden he has lived alone with nature and much of his philosophy is similarly or even more radically iconoclastic.

The topics lead naturally from one to another as do those in a lively conversation. The author seems to have talked with himself as he was busy among his beloved trees and shrubs. The books are concrete pent up soliloquies. The pressure on the author's mind, the mental tide so surged and swirled that two vacations were spent in dictating to a stenographer at the nut farm, and these books are the result. In them we are not concerned with trees and shrubs although they show us where in what attitudes he did the thinking. Hence the accompanying photographs, taken since the arrival of the books.

Even a naturalist must admit that the

books hallow Merrilbrooke more than all his extensive experiments with nut bearing trees. Mind is superior to matter. What he has thought and how he has made others think is of inconceivably wider influence than how he applied the bandages to buddings and other cuttings.

His philosophy of the wild five-petaled rose in comparison with the ordinary polypetalous "blaze of glory" influenced the editor to telephone to Philosopher Morris and ask him if he has many really good wild roses. "Yes, I have," he laughed. "What made you think so? I have a beautiful clump in the woods not far from the farmhouse door."

"All right. Expect me with a camera in about an hour."

These views show the thinker and his thinkery. The following brief quotations show the spirit of his books.

* * * *

"Some of the most beloved people do not know my feeling towards them. Were I to let them know about it, there would be reciprocation and exchanges of affection. That would take time,—diverting our thoughts toward

what is so attractive. Some of the men whom I esteem most highly do not know it. There are people who use affection and esteem for trade purposes, but it seems better to use them as a miser holds his gold, where one can gloat over affection and esteem in private."

* * * *

"I gave a spray of white azalea to a friend on an early July day. 'How wonderful!' he said. 'What delicate fragrance, what daintiness in shades of white,—if one can have shades of white! Is it Japanese? Now what do you think of that? No wonder people ask what is the use of living. My friend did not know where the white azaleas grew. It grows where the rose breasted grosbeak would waken him at four o'clock in the morning with a finer song than he would hear in town during the day. It grows where the hellebores say 'I'm here!' to the goddess of springtime—where the bracken fern offers best thanks for sunshine received, and where the Virginia turtle shows us a placer of unalloyed gold in the trout brook."



THE PICTURESQUE EDGE OF THE SWIMMING POOL DEDICATED TO YOUTH AND ENTHUSIASM.

Dr. Morris takes his morning dip here. Perhaps that has helped put so much vigor and freshness into his philosophy.



THE PHILOSOPHER AND HIS ROSE.

"I have a beautiful clump in the woods not far from the farmhouse door."



A BLAZE OF GLORY OF A DOUBLE ROSE.

Photographed by Mr. Nathan R. Graves, Rochester, New York.

"Is the most famous double rose really finer than the healthy simple rose after all? By the gods I do not know! Sit down by the side of a wild rose bush—and not vulgarly close, for it has tangible dignity indeed. It keeps one at an aristocratic distance until he has loved it enough to understand it. When one has loved the wild rose enough to take the trouble for really understanding it he is then at liberty to hold its finest flower in his hand, to press the soft petals against his cheek; to drink the royal clear pink into his color soul, and to enjoy the fragrance that is not for the careless passer-by, but only for him who seeks it affectionately, and

who finds it as a reward. And then the unfolding bud! There is exquisite modesty in its diffident advancement from the sepals which protect, even as the wise mother guards her beautiful daughter until the tender heart can bear the glance of a powerful but kind and generous sun, which might unwittingly do it harm.

"If I may have the choice between a wild rose and a double rose upon my grave, give me the sturdy wild rose that combines its colors with those of early morning sunlight in jewels of a thousand glimmering dewdrops, when the robin and the woodthrush are making the welkin ring with songs of life-joy and of praise for the coming day."

"My friend Dr. Bigelow, finding himself near his boyhood scenes, in the country, hunted up an old playmate who was not at home. The Doctor enjoyed the quaint old farmhouse and its surroundings, and was truly envious of the owner. He took a photograph of the house, and later sent a copy of it to his old time acquaintance. There was no answer to the letter enclosing the photograph, and the Doctor learned later that his boyhood companion called him all sorts of names, and said

"I sometimes hear a man complaining about having been born into the world against his will, an event concerning which he had no choice. What an ungrateful wretch! If you were born blind, and could have sight as a reward for being good for a period of ten years, how very, very good you would be for ten years at least. The complainer usually has first rate eyes. If you were born deaf, how good you would be if you were to be given ears as a reward of merit. The complainer usually has



THIS ROCK INSPIRES A "TOPIC" FAR AHEAD IN THE "TO-MORROW."

"Odd folks belonging to some strange new nation will come and sit upon the rock at the foot of my garden two thousand years from next June."

that if he was proud of living in a better house in the city, he ought not to taunt anybody by taking a picture of the old farmhouse and sending it to him. How many people there are in this world surrounded by beautiful things and envied by others but not aware of it."

* * * * *

"Men are best judged by their attitude toward other people, because that represents their unconscious and unguarded expression of personal feeling for the degree of need for self protection.

first-rate ears. With all his gifts a man is ungrateful. He obtained his gifts for nothing and consequently does not value them."

* * * * *

"I have always refused to look at life as anything excepting a good game of sport, with its proportion of good losers and bad losers among my friends.

"Would you like to know right now everything you will ever know? 'Yes!' That would spoil the game! You are not a good sport!

"If we knew everything at once it would be like playing a game of cards

backward after the game was over. There is no sport in that. There is great sport in playing the game of life if one plays fair.

"There is, to be sure, such a thing as luck, but man does not call it by that name unless it is going against him,"

* * * * *

"Which pays best, goodness or badness? Anyone who is bound to put the question upon a payment basis is himself bad. I can answer the question, however, having made observations for more than half a hundred years. It is my conviction that goodness and badness pay about equally well so far as material gains are concerned. Good people, on the whole are more comfortable. That is the only difference."

* * * * *

"I would rather have dogs and babies run to me instinctively, than to have a press agent succeed in working into 'the society columns' an impression that I was really on the inside with the exclusives."

* * * * *

"This is October the 5th, 1912. A perfect autumn day, and mine the luck to have traded temporarily a fine old shopworn city in exchange for my beautiful clean Merribrooke at Stamford. What would I not give to return to the farm house for one whole day an hundred years from now on October the 5th, 2012. Not in spiritual form with pure white wings and a golden harp, but just in my old duds. A felt hat torn at the top, hob nail shoes, and my canvas shooting coat minus a button or two, but with its treasury of capacious pockets all intact. The early gunners walked this morning through glinting frosty grass that was still being lighted by the crescent of a waning moon, long after signal lights had come from the east bidding the planet Neptune to retire. There will be no change in that particular morning order of the heavens for October 5th, 2012."

"It is difficult to live one's happiest life among surroundings of the city. It is only while at my old farmhouse in vacation time that these notes can be written,—near the pleasant sound of rushing water, where vireos are singing, and a chattering squirrel in the hickory tree tries to attract my attention. Here is where one can watch sunset clouds and smell ripening fruit.

These must be my joyful surroundings, for in the city one is engaged in making adaptation to duties of the day as one cog wheel fits into another cog wheel, rotating with the rest of town machinery. We may call it "life" in town, but "soul" is in the country. Who cares if soul and life were once synonymous terms away back in the dark beginning, so long as now the course of life, like the Nautilus of Dr. Holmes, establishes grander mansions as it progresses. Eyes brighten most when men speak of the country."

* * * * *

"A family is often proud when a genius appears in their midst. They should be sad, rather, because it indicates beginning disintegration of the family."

* * * * *

"One reason why science does not have so many advocates as general literature is because its reasons are not turned into feeling and the public is thankful to anybody who will serve as proxy for its thinking."

* * * * *

"In the good old days of my youth, there was a distinction in small vices of the different sexes. Where men swore, women shed tears and had a headache. Where men drank rum, women drank tea. Tea and tears were the equivalents of rum and swearing."

* * * * *

"A bright thought let us say is nothing but a potato expressed in another form of energy, just as the whistle of the locomotive is a piece of coal expressed in another form of energy."

* * * * *

"People understand each other very well on the whole. I have watched a bear for half an hour at a time feeding or playing right near me in the woods. I have watched a beaver at his work, often but a few yards away. They did not know they were being watched, or they would not have stopped long enough for two grunts. It is the same way with people. Their intimate habits are watched and understood by other people, just as I watched the bear and the beaver."

* * * * *

"When about to make a sarcastic remark, stop to think if you would do it beside a man's coffin when his hands are folded on his breast, and the white face can make no reply. If you would

not do it then, why do it now?"

* * * * *

"A young man said to a father: 'I suppose you will refuse if I ask for the hand of your daughter.' The father replied, 'Yes, I will refuse; but if you had put it the other way, that you were bound to have my daughter if you had to kill me first, you could have had her. As it is, you have defeated yourself at the start, and I do not want a son-in-law of that type of mind. A man who defeats himself on propositions at the start needs to be looked after by some one else most of the time.'"

* * * * *

"I have had under my care many an one whose history would make a novel, and yet the entire history would be of no real consequence to the world. If the same people had been engaged in some study of science their lives would have been completely filled, there would have been a life-satisfaction for them, and the social world would have profited by their presence instead of being subjected to a destructive attrition resulting from their friction applied to its surface. Tomorrow social efficiency experts will utilize such waste material."

* * * * *

"How quickly sympathy changes a man's entire point of view? In camp in the north we were all very fond of wild goslings for the camp table. One day I captured a couple of them when going off salmon fishing; kept them in the canoe all day for company, and toward evening handed a little fresh grass toward them. They came up and took it out of my hand, and I never could kill goslings after that."

"Although meat is a necessary article of diet for most people I suppose that as we get older we all dislike more and more the idea of having anything killed. Hot roast duck stuffed with chestnuts, mushrooms and sausage, and served with a flood of rich brown gravy is pretty good, but any one who has had cunning little yellow downy ducklings climbing all over his feet and hands and has watched them grow under his care, would rather have someone's else ducks killed for his dinner. When eating roast duck I always try to imagine that it was raised by somebody who didn't know Timmie from Dickie,—somebody who raised impersonal ducks."

"I often wish the pathetic did not appeal to me so deeply, for it does not seem to belong to a broad shouldered bear hunter who is about six feet in height. When I find a little dead bird lying upon its back with feet outstretched in mute appeal against a decree which could bring destruction to one so little and innocent, I always know where tears start from in women. It is from a place away down deep. It requires something of an effort to put aside the feeling on the ground that it is womanly, and not masculine in origin."

* * * * *

"Thousands of women of education and refinement spend a large part of every day in card playing. This is done largely by time-wasters of the elim



HE BUDS A PISTACHE BRANCH AND A THOUGHT.

group. Imagine how a country would progress if all these minds were to be engaged in any department of natural science whatsoever."

* * * *

"I know an elderly couple who lost all their money. They formerly entertained extensively, and carried all of the complicated responsibilities of social form. Now they sing all day long since the money is gone, and say they were never so happy in their lives previously. They are on a tiny salary, keeping chickens and enjoying life. Their former butler came to call upon them one day when I was present. He looked very grand. Why is this couple happy? One reason is because a former butler would call respectfully when their money was gone."

* * * *

"Happiness is said to consist in not wanting what we cannot get. Satisfaction is really better than happiness, the satisfaction of getting things in the end which one was not quite sure he would obtain.

"Contentment is to be deprecated if it leads to inaction. The man who is most contented when he is hardest at work has the right sort of contentment.

"Contentment is not altogether pleasing to nature and she sees to it that it does not last long unless one is contented when at hard work.

"Most people are well off, but they do not know it. Often when hunting I have been cold, wet and hungry, and have thought how well off people were with their warm clothes on, in some distant house in which I saw the light shining from a window. Perhaps the people there were uncomfortable also but in a different way, bothering themselves with some financial or social question or disturbed about their neighbors. They were well off but did not know it."

* * * *

"Among all bird songs appropriate to the environment what can be more delightful than the song of the woodcock? It is the song of the tenderest of lovers, and it strikes the very note that poets have sought in their ideals of love in a cottage, or of a secluded spot in some far wilderness. The song of a woodcock is the dearest song in the world. Would that some one would

sing to me such a lullaby! All is quiet in the valley. Moonlight is transmuting spring mist into gold. The jingle of silver bells of the Hyla chorus comes faintly from some distant marsh. Then it is that the woodcock looks into the dreamy eyes of his beautiful bride and springing aloft with twittering wing,—stills the wing note when high in the air, and warbles so softly and sweetly to his true love that it seems almost sacrilege to listen. It is not to the multitude that he sings. Oh, no, indeed! 'It is just for you and me, Betty! Not for the world would we disturb any one with our affection, but we love each other and our happiness is complete.'"

* * * *

"We love people who bring out our best qualities, and avoid those who bring out our worst qualities."

* * * *

"Anger and emotional stress of any sort places an undue burden upon the liver, with bad reciprocal consequences, and may give one gall stones."

* * * *

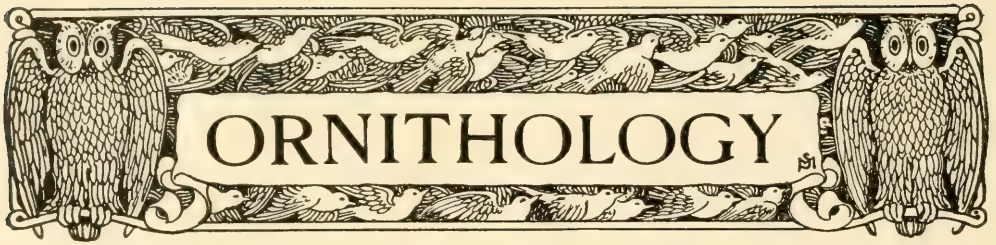
"Men of large affairs are knocked down on favorite propositions every year of their lives and they enjoy it as much as hearty players enjoy the bangs in a football game."

* * * *

"Had I twenty-five millions of dollars to give away at the present time, I would give ten millions of dollars to a certain medical school which teaches graduate doctors to be of greater service to humanity in modern ways. Ten millions of dollars would go to the natural history departments of my former alma mater and five millions of dollars would be devoted to my experimental work in developing nut trees for furnishing a great food supply for the masses of the future."

* * * *

"I find the only way for obtaining mental relief is to emulate the guinea hen, and she is now my pet symbol. A guinea hen will find a choice corner in the brush lot and soon has forty eggs in her nest. Then she sits in the middle of the nest. She cannot hatch all of the eggs, but hatches out all that she can, and lets the rest go. The lesson taught by the guinea hen came to me as a great comfort."



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

Let Us Make It Better!

Hyde Park, Mass.

To Our Readers:

In assuming the responsibility of this department, I have done so somewhat reluctantly and only with the confidence in our readers of their willingness to assist in making it a success.

Let us have a department as brimful of interesting bird notes and observations as the bobolink's song is full of melody. To do this we must depend upon the help of many rather than the over-exertion of a few.

Personal observations and anecdotes of bird-life are always interesting and faithful research by our thousands of readers in their widely separated localities cannot fail to bring to light much valuable information.

Take your note-books and pencils with you afield. If you have a camera you will get so much more enjoyment out of your study. Sharp eyes and ears are the prime requisites. In any event observe accurately and do not over-look details—these may be the most important—and above all, never jump at conclusions.

By the interchange of ideas, the results of what we see and hear and the facts learned we should be able to help each other and may each learn something to our profit. First-hand study is what we want and opportunities are never lacking for faithful observers.

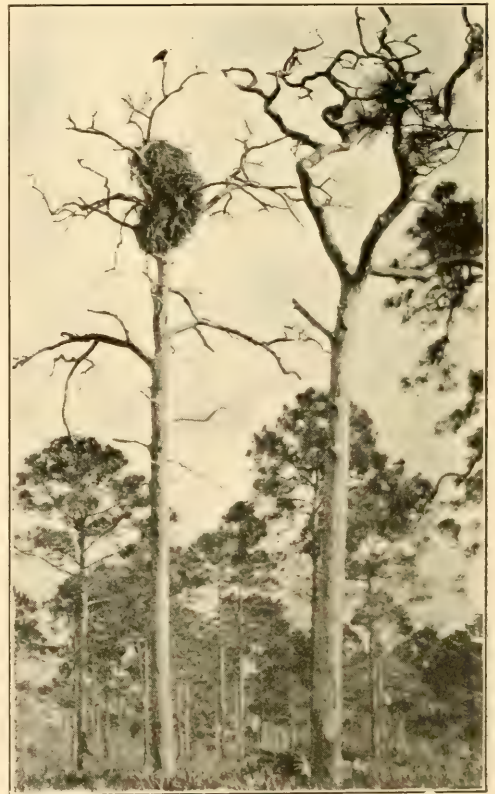
Bespeaking the indulgence of our readers I wish to assure them of my earnest endeavors to make this department of interest to all, and to urge their co-operation in the attainment of this end.

HARRY G. HIGBEE.

A Visit to the Home of the American Eagle.

PHOTOGRAPHS BY DR. A. W. KING AND
THE AUTHOR.

About midway along the western coast of Florida, where the blue waters of the Gulf of Mexico lap the white sands and wash up curious sponges, shells, and other forms of marine life, a channel has broken through the low-lying coastal reefs, and finding its way in graceful curves among the palmettos, has spread out its waters into the quiet



BALD EAGLE AND NEST.

and peaceful seclusion of Dona Bay.

Far up in the eastern arm of this bay are the few scattered houses and orange groves of the little town of Venice. Aside from the enjoyment of life, the raising of citrus fruits here seems to be the principal occupation of the inhabitants,—except for the intrusion of the turpentine camps, whose exhaustive work is causing the beautiful and characteristic groves of longleaf pine to fast disappear.

Here, in a grove of scattered pines near the shore, within sight of some of the houses on the outskirts of the village, and but a few rods from the sandy road which winds through the scrub palmettos, my companion and I saw our first nest of the bald eagle. It was a huge mass of sticks, which the top of the stout pine in which it was placed seemed hardly able to support, and its height commanded a good view of the surrounding territory.

We had been observing this magnificent bird for the past month, on our cruise down the east coast and through The Everglades,—admiring his imposing attitude as he sat perched on the tallest cypress of an inaccessible swamp, sometimes for more than an hour; marking his rapid flight in pursuit of the osprey, to rob him of his quarry, or watching his dignified movements on an occasional fishing trip of his own, along the mangrove keys,—and it was thus with a keen delight that we at last beheld the nest of "The Bird of Our Country."

It was on the evening of the seventh of January, 1914, while Old Boreas still held New England in a savage grip of intense cold, that we entered Casey's Pass and anchored our launch on the placid waters of Dona Bay. The sun was just setting over the gulf, rimming the horizon with an indescribable coloring of crimson and gold, and the fringing palm trees along the shores leaned far out over the water, as if to admire their beauty reflected in perfect image below. A delicious odor was in the air, for it was spring along the hummocks and bayous of tropical Florida. The buds were swelling and bursting on the live-oaks; flowers were in bloom, and the birds were doing their best to instill into us some of their exuberant joy. Bluebirds called softly; meadowlarks whistled, and Florida wrens warbled



THE PALMETTO BLIND, CONCEALING THE CAMERA AND PHOTOGRAPHER.

their ventriloquial notes, and as these died away the purer strains of a hermit thrush came floating across the water, bidding us a sweet "good-night."

We had planned to spend but one night here, but on learning from a friend whom we visited that evening of another eagles' nest in the vicinity, we decided to stop over in hope of securing some photographs of the home life of these birds. Before breakfast on the following morning our good friends were alongside in their canoe, and we made our plans for a visit to the eagles' eyrie.

The first nest appeared not to be occupied, though we learned it had been used for several years past—usually in the month of February. It was about sixty feet up in the tallest pine in the grove, and we estimated it to be over six feet in depth and three or four feet in diameter. It was apparently composed entirely of sticks, although we made no attempt to ascend the tree, as it was seemingly impossible to climb up over the bulky mass.



THE FEMALE EAGLE UPON THE NEST.

After photographing this nest our friends guided us to the other grove not far away, where a pair of breeding birds were said to be, and we had no difficulty in locating the spot. Indeed this great nest, which was considerably larger than the other, was the most conspicuous object in the grove, being placed in the upper crotches of a large dead pine, where the watchful birds might obtain an unobstructed view. A long distance observation through our binoculars showed the nest to be occupied,—the white head of the parent bird showing distinctly over the top,—so making a detour of about half a mile, I attempted an approach near enough to secure a photograph of the eagle upon the nest. The birds proved extremely wary, however, and scrub palmetto rather difficult to make one's way through quietly, and while still about a hundred yards distant the bird arose and circled about overhead, uttering a series of rapid shrill cries, accompanied by a low scolding and hissing when directly above me. The male bird, which had been soaring far overhead, now joined its mate and they continued their circling about with cries of alarm. We could distinguish a difference in their calls,—

that of the male being a rapid, whistling alarm or cackle, and uttered more regularly than that of the female: the plumage of both sexes being alike, these birds are otherwise indistinguishable. Their conspicuous markings,—in the adult a uniform brownish-black, with the head, neck and tail of pure white,—and their large size, with a wing-spread of over six feet, give to these birds an imposing appearance, and to watch them at close range in their native haunts was a rare privilege which we thoroughly enjoyed.

By partially concealing myself in the scrub palmetto and standing in one position for about an hour, I was able to secure a photograph of the nest and both birds, and finally another of the female about to alight upon the nest. I then withdrew to where my companions had been waiting—being followed by the agitated birds until well out of the grove—and planned to return the following day for further observations.

There was a spring feeling in the air as we went ashore the next morning, with two cameras, climbing-irons, life belt and ropes, prepared to spend a day with the eagles and if possible to make a close scrutiny of the nest and its contents. There had been rain in the early morning with clearing about seven, the temperature was 65, and a fresh clear atmosphere made every breath exhilarating.



THE EAGLE ABOUT TO LIGHT UPON HER NEST.

We met our friends at the bridge, and as we walked through the woods the white-eyed towhees and meadowlarks mounted the scrub palmettos and called; several loggerhead shrikes were in evidence, and a pair of red-bellied woodpeckers were busily engaged hunting about on a cabbage palm. At our close approach they flew across the water,—the male giving a loud, rattling call like that of a kingfisher as he flew. Ground doves moved noiselessly about under the scrub, while the animated wrens jerked restlessly over it or disappeared beneath the broad leaves, only to peer out from some hidden retreat with a chuckling call, as if they had gotten the best of us,—and so they had, for they were ever present yet always disappearing just as we wanted to watch them.

The eagle allowed us to approach to within about fifty yards of the nest before taking flight this morning, and remained in a nearby tree until we were very close. She then began circling about overhead and uttering a low guttural note, while the male soon appeared giving his sharp, piercing cry. Selecting a favorable spot, the 5x7 camera was set up close by and focussed on the nest. We then constructed a rough blind of palmetto leaves about it, concealing all but the lens and leaving room to crouch behind and work the camera. Entering the blind, I was covered by my companions, who then walked away making no attempt at concealment, and the birds after following them out of the grove, returned and ceased their cries, circling about and apparently paying not the slightest attention to the blind. They were evidently able to distinguish no difference between three persons entering the grove and two persons leaving it, and their actions clearly indicated that they did not realize my presence in the blind.

The following detailed notes of the birds' actions will give an idea of their extreme wariness and watchfulness about the nest. The male almost immediately flew away, while his mate circled about a few times and then perched on the tree within a few feet of the nest, where she sat looking into it with mouth open but uttering no cries. It was now eleven o'clock. After a few moments in this position as if to assure herself that her home had not been disturbed, she flew up; hovered for an instant over the nest, then flew off, cir-

cling about a few times and seeming to scrutinize the ground below, and at 11.05 returned and dropped into the nest, soon settling down where she could not be seen over its rim from my position in the blind. After making several expos-



AT THE EAGLE'S NEST.

This nest, seven by twelve feet, was seventy feet up in a dead pine eight feet in circumference in a grove of long-leaf pine.

Photograph by Dr. A. W. King.

ures I quietly watched. At 11:20 the male came circling over the tree, but without alighting and with no cry flew immediately away. I then made a slight sound to attract the attention of the bird on the nest so she would hold her head up high enough to show in the photograph,—which she did, but immediately settled down again out of sight.

At 11:33 she left the nest, evidently alarmed by something, and circling about she alighted on a tree, called several times and then flew away. At 11:43 she returned, and slowly circling overhead a few times, alighted near the nest, uttering some low, cackling notes. She remained thus, looking about and below her for three minutes, then again circling about emitted several rapid, whistling calls followed by shrill peeps. After several minutes absence she returned to the tree and looked about from her perch for two minutes; then flew off, again circled about and returned without calling, remaining, however, but a few minutes, when she was off again. Soaring in circles overhead she uttered several rapid calls,—shrill whistles beginning with a rising inflection and rapidly running downward: then in a few minutes returned to the tree and at 11:59 dropped onto the edge of the nest—where she remained for three minutes, then flew off, circled and returned to her perch on the tree.

Here she remained for nine minutes, uttering no sound but scanning the surroundings closely. She then flew away, circling about with a shrill call, and at 12:17 returned and alighted on a dead pine near-by. Remaining here for four minutes, she flew up, hovered over the nest, called twice, then circled about a few times and returned to the near-by tree where she looked about for a few seconds; flew to her perch over the nest, and after again scrutinizing the nest and its surroundings, hopped quietly onto it. She seemed still restless and at the snap of the camera flew off and soared about, soon returning to the tree close by where she perched for a few moments; then was off with more circling, after which she alighted near the nest and again dropped onto it at 12:35. Almost immediately leaving, she resumed her circling for about five minutes, when she returned to the near-by tree. After making a few exposures with the Graflex camera as the eagle soared overhead I emerged from the blind,—feeling somewhat cramped and uncomfortably warm from my confinement of over two hours, but pleased with my observations. The watchful bird had spent about a fourth of this time upon her nest, and in her restlessness and anxiety had left and returned to it sixteen times.

At one o'clock there was a temperature of 74 and a fresh east wind. We lunched at our friends' house and returned to the eagles' nest at one-thirty, the bird leaving quietly when we were a hundred yards away. I at once made ready to ascend the tree, which was a dead long-leaf pine eight feet in circumference. Climbing to the top where the huge nest was set among the forking branches was not an especially difficult task, but I now found myself beneath a mass of sticks measuring *seven feet in diameter and twelve feet high*, and the problem seemed to be how to get around and above it. After working on one course for half an hour and being compelled to abandon it on account of the rottenness of the branches, I managed finally, by throwing a rope over several of the limbs, to pull myself up; and standing on the uppermost branch coming out of the side of the mass I peered over the top and into the nest. I was immediately greeted by a young eaglet, which, uttering long peeping cries, scrambled to the edge of the nest to meet me. I judged

it to be about two weeks old. It was covered with a soft grayish down, had snapping black eyes and a black beak, and although not strong enough to stand upon its feet, it insisted upon working itself to the edge of the nest nearest me after I had continually replaced it toward the middle.

This nest was evidently a very old one showing where it had been added to and repaired year after year. It was a solid mass of coarse sticks, some of which were over two and a half feet long and an inch or more in thickness, and the huge bulk must have weighed more than five hundred pounds. There was but a very slight depression in the top and no attempt at a lining of softer material. A few clumps of coarse grass and a bit of moss lay among the sticks near the upper edge, and scattered about through the mass were a few fish bones, bird skulls, etc. The remains of a fresh, partly eaten catfish, about a foot long, lay in the nest beside the eaglet.

Lowering a rope, I drew up my camera one at a time, and made several attempts to photograph the young bird, though I soon found that maneuvering about with such apparatus sixty feet in the air,—with nothing above you to hold onto and your subject determined to walk into the camera,—was not conducive to pictorial success. I finally tried focussing on an object the approximate distance from the lens and holding the camera up over my head to get it far enough away from this inquisitive young chicken,—and thus out of five attempts secured one passable picture.

The view from this eyrie was superb. There was no chance for an enemy to approach unobserved by the keen-sighted birds, as they could see for a long distance in every direction. Considerably above the tops of the surrounding trees, they would be first to receive the breath of the new dawn, while away to the westward over the sparkling gulf the last glow of the sunset would be theirs. Even now as I looked, the great fiery ball was dropping into the midst of those rippling waters,—its slanting rays still lighting up the nest with a glow, though it had disappeared from view from the ground beneath some minutes before.

After holding up the eaglet to the view of my companions below, I carefully replaced it in the nest and descended to the ground, having been in the tree two hours and fifteen minutes. Although I was prepared for trouble from the pa-

rent birds, they made no attempt to defend their nest and young, and during all this time soared majestically about, high overhead.

The next morning we noted both eagles circling about the nest, but did not re-visit it. Subsequently inquiries in the vicinity showed that both nests here referred to have been occupied succes-

on a most exciting trip as far as Sarasota Bay—which, however, is another story and has nothing to do with eagles.

State Bird Sanctuaries.

A new field of service for Natural History Societies is made possible by the Massachusetts statute which gives



THE EAGLET IN THE NEST.

sively for the past seven years, a family near-by assuring us that the large one has been used to their personal knowledge for at least eighteen years, being when they first knew it but a comparatively small nest. We were told that the eagles leave this locality about the first or middle of August and are absent for a period of about two months. A pair had been seen roosting nightly in the trees near here, and another pair about a mile away. We learned also from a woman living not far distant of a still larger nest which she stated she had known for over twenty years. We did not, however, have opportunity to investigate it, and though we saw other eagles in this general locality,—both in the immature and adult plumages,—we could not spare the time to search for their nests.

With urgent invitations to return we left Venice about sunrise on the morning of the twelfth, to continue our cruise up the west coast. Somewhat reluctantly we left our anchorage and passed out of this quiet bay, for it was a charming spot and we had made several new friends, three of whom accompanied us

to the Fish and Game Commissioners power to take over land, on request of the owners, and use it as sanctuary for wild life.

The Andover Natural History Society, for example, selected a tract of wild country some two miles long and a half mile wide, containing a stream and a small pond, and persuaded its owners, some fifteen in number, to join with it in having the area made a State Reservation. The society undertook to relieve the owners of all trouble and expense, to put up bird houses, to keep down enemies of the interesting wild life, and to feed the creatures through the winter. In return, the owners are protected by the state officers from the depredations of gunners—so that as a matter of fact, they were nearly all heartily glad to come into the scheme.

Thus through the efforts of the local society, the community has added an interesting feature to its other attractions, although no single owner had any special interest in the matter or

would have put himself to any trouble to secure the result. In addition, while notes in the local paper have educated the adults, by having the public school classes in carpentry make the bird houses, zeal for wild life protection has been given a distinct "boost" among the young.

Here then, in states where the laws make it possible, is an interesting and worthy field of effort. To any organization disposed to attempt a like project, the Andover Society offers freely the results of its experience.—Address E. T. Brewster, Andover, Mass.

An Unusual Vireo's Nest.

The accompanying photograph shows the nest of a red-eyed vireo found in a very unusual and beautiful location. It is from Merrimac, N. H. and was placed in the low branches of a young white pine, where it was but a little over two feet from the ground and seemed well concealed among similar growth and scrub hardwoods near the edge of an open pasture.

This nest when first visited, on the morning of the 29th of June, contained naked young, apparently but a few days

old. Thinking from its location in the pine tree that it might be the nest of the "blue-headed" rather than the red-eyed species, I visited the place with a jack-light about ten-thirty the following night to positively identify the bird upon the nest. By approaching carefully with the light held out in front I was enabled to get within two or three feet of the nest without being noticed by the brooding bird who was fast asleep with her head buried under her right wing. After studying her for about a minute she suddenly awoke with a startled look in her deep red eyes and gazed intently at the light, but remained motionless. The compactly woven nest of strips of bark and fibre, decorated with bits of paper and white birch bark lighted up beautifully against the soft delicate green background of pine needles and made a pretty picture. Not wishing to disturb her further I quietly withdrew, making another visit the next morning and finding her again on the nest.

My next opportunity for visiting this nest was on the tenth of July, when I found it empty, with no traces of either parents or young in the immediate locality. It may have been possible that the young birds had flown, though I half suspect that a large black snake which I found lurking in the vicinity may have had something to do with their disappearance.

The English Starling.

The U. S. Department of Agriculture is making a wide-spread investigation of the status of the English starling, a bird recently introduced into the United States, which has been considered by many an undesirable addition to our fauna. It is a bird which has increased and spread rapidly and seems able to hold its own against all comers, and it is to be hoped, therefore, that its beneficial traits will so far outweigh its injurious ones that this handsome bird may be welcome to remain with us. Nobody wants a second "English sparrow."

I wish to express my appreciation of THE GUIDE TO NATURE. We have found much of interest and have been greatly aided in our efforts to become better acquainted with nature.—Miss Matilda Krebs, Johnstown, Pennsylvania.



A VIREO'S NEST IN A WHITE PINE

Photographing Young Birds.

The most attractive age of a young bird is usually the first week or so after it has left the nest,—when it is launch-



YOUNG CATBIRD JUST AFTER LEAVING NEST.
Photograph by Mr. Charles I. Reid, Millersburg,
Pennsylvania.

ing forth into the world to try its own resources. It is shy, yet it seems to know no fear: its poses are graceful combining with the freshness and vigor of youth some of the dignity and repose of the adult. This period might be said to be the "sweet sixteen" of bird life, and it seems to contain all the attractive qualities of the bird with none of the objectionable ones, making its subject as lovable as an opening flower.

Bird Notes for New York City.

BY MISS ELIZABETH VAN HOEVENBERG,
FISHKILL, NEW YORK.

A Blackburnian warbler was observed May 17, 1914, on Lenox Avenue at 129th Street, in a tree near the curb in front of a florist's greenhouses.

Kinglets and redstarts have been seen among the trees and shrubs of the Upper Campus, Columbia University, New York City.

Juncos, feeding among the chickens on a "Harlam Squatter's" claim, on Morningside Drive, at 121st Street, before the great apartment houses, now there, were built.

Flickers and goldfinches, in Riverside Drive between 116th Street and Grant's Tomb, late in November.

Bird Photography for Women.

That bird-photography is not only possible for women to enjoy, but that it may be made one of the most fascinating and healthful of out-door studies is shown in an interesting article under the above title, published in the May-June number of "Bird Lore." The author is Miss E. L. Turner, F. Z. S. of Cambridge, England.

A number of women in our own country have also done most admirable work along similar lines, and such results should be encouraging to others who are taking up this useful pastime.

Remarkable Devotion of a Robin.

BY REV. MANLEY B. TOWNSEND, NASHUA,
NEW HAMPSHIRE.

A number of years ago, when living in Southbridge, Mass., this remarkable robin incident came to my notice. A friend, a conductor on the railroad that runs from Thompsonville, Conn., to Southbridge, told me the story.

One morning at Thompsonville a passenger car that had been standing idle on a siding for several weeks was attached to the train. Several miles out of the place the attention of some passengers standing on the rear platform was attracted by the peculiar actions of a robin that seemed to be persistently following the train. My friend, the conductor, was informed and a close watch kept upon the bird. Yes, it was certainly following the train, but for what purpose? The answer soon came, for when the train made its first stop the robin flew directly to the car and disappeared beneath the trucks. An investigation revealed a nest containing four newly-hatched young, on whom the mother was sitting close. Bright-eyed and fearful, but bravely, she eyed the faces thrust close to her and her treasures. When the train started she flew out, but followed faithfully the entire run, brooding and warming her babies whenever the train stopped and afforded her the opportunity. Thus she kept them alive and warm until Southbridge was reached. The conductor at

once notified the railroad officials, who gave orders that the car should be detached and set apart.

It is gratifying to be able to report that such devotion had its fitting reward, and that the little family was safely reared and launched out into the world. The other day I read of a mother who made a great sacrifice for her child. Readers of the deed were thrilled by the mother-love behind the act, yet here in this simple, humble bird we find the same mother-love,—strong and beautiful. Shall we not render her our tribute as truly as if she were a human mother?

An Ambitious Wild Goose.

In the Zoological Park we have reared yearly a goodly number of Canada geese, our flock of these birds now numbering more than fifty. In the spring of 1915, the usual number of pairs nested, and succeeded in hatching their goslings. But one curiously acquisitive and equally pugnacious pair, apparently dissatisfied with their own brood of five, decided to increase it. By means of a system of browbeating on one hand, and persuasion on the other, they actually succeeded in ab-

ducting the goslings of other birds until they had gathered a flock of fifteen; a number entirely without precedent in the writer's experience.

The trouble of the "old lady who lived in the shoe" was caused by the fact that she didn't know what to do with so many. Our geese never betrayed any such tribulation, and while there was some scantiness of space beneath the sheltering feathers of the mother, the overflow could always collect alongside and receive a share of warmth. All are being safely reared, and the excellence of their care is attested by the evident prosperity of the goslings, as shown in the accompanying picture.—L. S. C. in the "Zoological Society Bulletin."

"American Forestry" for July contains a five-page article on "Bird Protection and the Work of the Brookline Bird Club" in Brookline, Mass., an organization which has done invaluable work in that town. This magazine also makes the following announcement: "Birds and the Need of Them" will be another subject given a special department. The conservation of birds is vitally necessary to the preservation of human life. So few people realize this that "American Forestry" will make a



CANADA GOOSE WITH HER KIDNAPPED GOSLINGS
Cut by courtesy of the "Zoological Society Bulletin."

special effort to promote proper protection and care of birds."

It is indeed gratifying to note the interest being shown in this subject by such magazines, and denotes an awakening which is becoming wide-spread and must certainly result in a great deal of good. Publicity means education, and education means progress.

Dr. Arthur W. King of Jacksonville, Fla., who has recently returned from a motor-boat trip around the lower part of that state, brings back well authenticated reports of a good-sized colony of Roseate Spoonbills on an island near Caxambas on the west coast, and it is hoped arrangements may be made at once for the protection of these beautiful birds, which were formerly so abundant but had become nearly exterminated throughout the state. It is gratifying also to learn of the large rookeries of the "great white" and snowy egrets in regions through which he passed, the recent increase of these birds being largely due, no doubt, to the excellent work of the Audubon Society which has done so much to stop the plumage traffic and to protect the fast-disappearing birds of this region.

Two recent publications by the Mass. State Board of Agriculture of especial interest to bird students are Circular No. 45, entitled "The Starling" and Circular No. 47 on Bird Houses and nesting Boxes." The former gives a history of the introduction of the Starling into America and the increase, distribution, food and habits of this bird of questionable character, while the latter covers well the subject of which it treats, and being fully illustrated should be of valuable assistance to those contemplating erecting bird boxes on their grounds.

Both circulars are by Edward Howe Forbush, the State Ornithologist, known throughout the country for his painstaking work and valuable contributions on economic ornithology.

The many attractive appliances in the nature of feeding stations, nesting-boxes and bird-baths now offered the bird-loving public are doing much to stimulate an interest in our feathered friends and to bring us into a right relation with these most valuable as-

sistants to our agriculture. We are dependent upon the birds much more than the average person has realized, and their protection and increase about our homes has a large bearing upon the insect problem, which is so vital to any lover of trees. Let us not forget them when we plan our grounds.

Beautiful Photograph of Snowy Owl.

Ebensburg, Pennsylvania.

To the Editor:

I am sending the photograph of a snowy owl, which I took some time ago. Experts say that this species of



A SNOWY OWL.

owl is rare in Pennsylvania, and is usually found in the state of Maine.

The bird is one of the most beautiful specimens of this type ever seen. It was shot and slightly injured near Ebensburg, Pennsylvania, and upon discovery that the bird was in the protected class, was turned over to the state game warden for this district.

Yours very truly,

DECK LANE.

A Four Month's Trial Subscription for only 25c. Send to a friend.

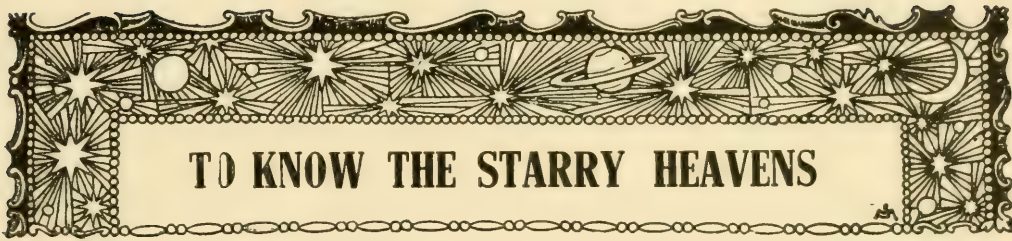


BLACK-THROATED LOON ON NEST.

A Real Not a Wooden Bird.

In this remarkable specimen of the black-throated loon, nature has successfully imitated an artificial bird made

apparently of wood and striped with paint. It is a photograph of the living bird. For its use we gratefully acknowledge the courtesy of "Bird-Lore."



TO KNOW THE STARRY HEAVENS

Contributions to the Sound Beach Observatory.

Miss Frances H. Errett, New-town, Ohio (Increase—total \$179.38)	\$154.38
Dr. P. J. Oettinger, New York City	1.00
Miss Eulalee Finney, Sound Beach	1.00
The Frost Family, Sound Beach (\$1.00 each)	5.00
Mr. H. E. Deats, Flemington, New Jersey (Increase—total \$15.00)	10.00
Mr. Thomas W. King, Sound Beach	5.00
A Friend	2.00
Mr. W. W. Lathrop, Warren, Ohio50
Mr. William T. Finney, Stamford	1.00
Reverend Fay E. Livengood, Sound Beach	2.00
Mrs. H. H. Knox, New Canaan, Connecticut	1.00
Mr. Mitchell Kennerley, Mamaroneck, New York	5.00
Total	\$187.88
Previously acknowledged ...	506.20
Grand Total	\$694.08

Here is a good example for other young folks. Miss Eulalee Finney of Sound Beach has contributed a dollar to The Agassiz Association for a telescope, and writes as follows:

"I earned a dollar a few days ago, and I want you to have it, to help buy the telescope which I know we shall all enjoy."

It is probable that every girl and boy in Sound Beach would contribute at least five cents each if it could be made clear to all young folks how much they will enjoy and be benefitted by becoming familiar with "the wonders of the sky." These wonders are marvelously entertaining, and few people, even the adults, know much about them. Eula-

lee Finney is right in the statement that we shall all enjoy the telescope. The heavens are moving pictures that are not "trash," and that are always uplifting in thought.

Variable Star Observing. Fascinating Work for the Amateur Astronomer

BY WILLIAM TYLER OLCOTT, CORRESPONDING SECRETARY, AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS

There may be many members of The Agassiz Association who possess small telescopes. By small telescopes I mean those mounted on tripods of three to five inch aperture. It is the purpose of this article to outline briefly how telescopes of this type may be turned to good advantage in the aid of science by anyone willing to engage in an interesting bit of astrophysical research work that involves no mathematics and the details of which are quickly and easily mastered.

There are many stars, telescopic for the most part, that, strange-enough, do not present the constant state of brightness that characterizes most of the lucid stars with which the layman is familiar. The light of these stars, which are known as Variables, fluctuates, and the law that governs their variation presents a baffling enigma, which only time, and a large number of observations can solve.

Professional astronomers the world over are for the most part too busily engaged in solving other great astronomical problems to give much attention to Variables, and consequently this important work has been somewhat neglected, and the field is open to the amateur astronomer with his modest telescopic equipment to do something that is worth while in the realm of astronomical research that so many think is for the professional astronomer alone.

The only requisites for the work, aside from a certain amount of patience and perseverance, is a knowledge of

the constellations, easily acquired, a "Star Atlas," (a good one can be purchased for \$1.25), and the charts which the writer will gladly furnish to those who wish to take up the work. The method of observing is briefly as follows:

On each of the charts the Right Ascension and Declination of the Variable is designated, that is to say, its latitude and longitude terrestrially speaking. First the position of the Variable is roughly plotted on the "Star Atlas," and then the region is swept over with the telescope, using a low power ocular until the immediate field given on the chart is identified. The Variable is then easily located. This may strike the reader as difficult, but it does not prove so as many have found out who have essayed this form of observational work.

The observation of the Variable then follows. On each chart are a number of constant stars that have been photometrically measured, and their definite magnitude is designated. These are the comparison stars. Note one a trifle brighter and one fainter than the Variable and you have the means of ascertaining and estimating visually the magnitude of the Variable on the date observed.

Observe the Variable a few nights later, and you will note a change in its degree of brightness. Continue the work for a time and you can trace out its light curve in full, thus determining very closely its exact magnitude at maximum and at minimum, and the date of each, which constitute valuable scientific data.

There is nothing monotonous about the work, and every observation you make has a positive and scientific value which renders observing a pleasurable and interesting task. You always have the assurance that your time is well spent, and that you are not engaged in the desultory work in which class so much that the amateur does with the microscope and telescope falls.

Once you engage in Variable star observing you will become fascinated with it, and will wish to join the American Association of Variable Star Observers, a group of amateurs who delight in this interesting telescopic employment.

There are no dues to frighten you a-

way, or exacting obligations of any sort. You simply agree to observe Variables when it is convenient, and pay a nominal tax of twenty-five cents per annum to cover postage. You are furnished with a valuable set of charts gratis, and in return make a monthly report of your observations to the Harvard College Observatory and the writer. The observations appear each month in "Popular Astronomy," and later are published in the Harvard Annals.

Here is a chance you have been looking for. An opportunity to assist if even by the contribution of a mite in adding to the sum total of scientific knowledge.

The work is endorsed by Professor E. C. Pickering, Director of the Harvard College Observatory, who considers it to be the most valuable and useful that the amateur can engage in.

Get out that old glass up in the attic. It is a valuable scientific instrument in intelligent hands. You can do as good work with it in observing Variables as can be done with an expensive telescope of great aperture. You will not find the work difficult, of that I can assure you, for many write me that they have success from their initial efforts.

Naturally the quality of the estimates depends on constant practice, but in a wonderfully short time the eye yields results that are reliable and valuable.

Some day we will know the secret these inconstant stars now possess, and the fame and satisfaction of the discovery will be shared in a great measure by the faithful group of amateur astronomers now engaged in this delightful and intellectually profitable telescopic work.

I'm willin' a man should go tollable strong

Agin wrong in the abstract, for that kind o' wrong

Is oilers unpop'lar an' never gits pitied,
Because it's a crime no one never committed;

But he musn't be hard on partickler sins,

'Coz then he'll be kickin' the people's own shins.

JAMES RUSSEL LOWELL.

A Young Man's Homemade Telescope.

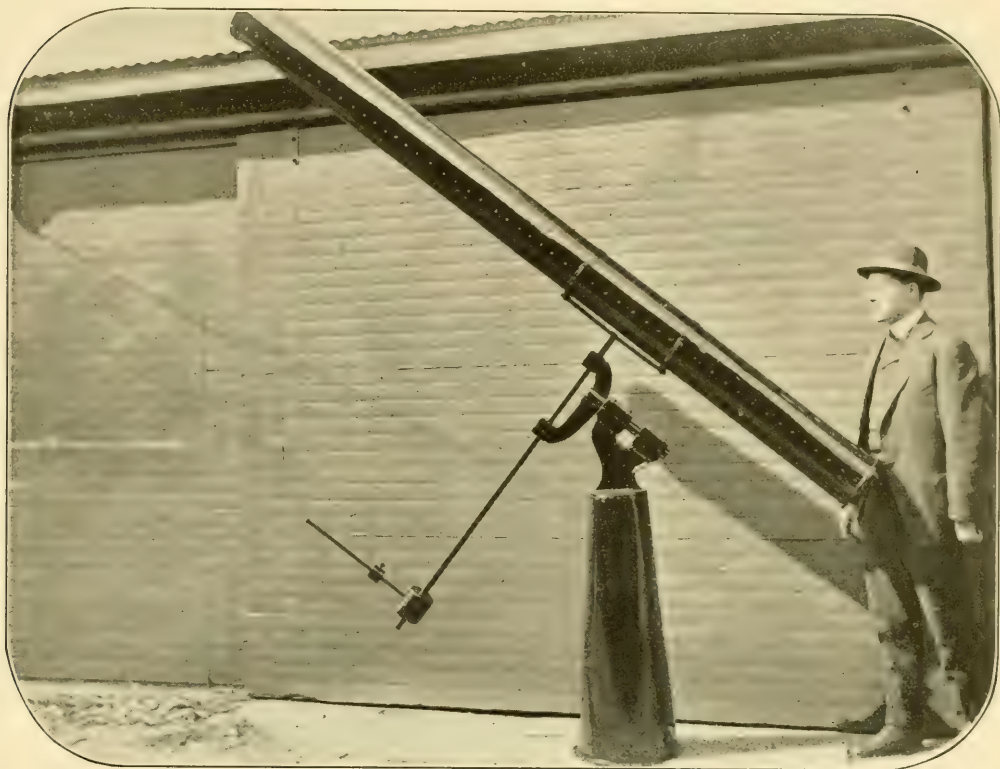
Dayton, Ohio.

To the Editor:

Enclosed you will find a picture of the telescope that I constructed with the aid of Mr. Fosdick. The instrument is a

astronomer as R. E. Fosdick declares is as good for all practical purposes as any telescope costing \$150.

"John made his own design of the telescope according to directions that he read in books obtained from the library.



MR. JOHN L. WALLACE AND THE TELESCOPE HE MADE

reflector of the Newtonian type with a mirror six and one-half inches in diameter and a focal length of one hundred and ten inches.

Some of the parts are odds and ends found in a garage, such as an automobile drive shaft for a declination axis, but for the larger part I bought the material and worked it down.

Yours truly,

John L. Wallace.

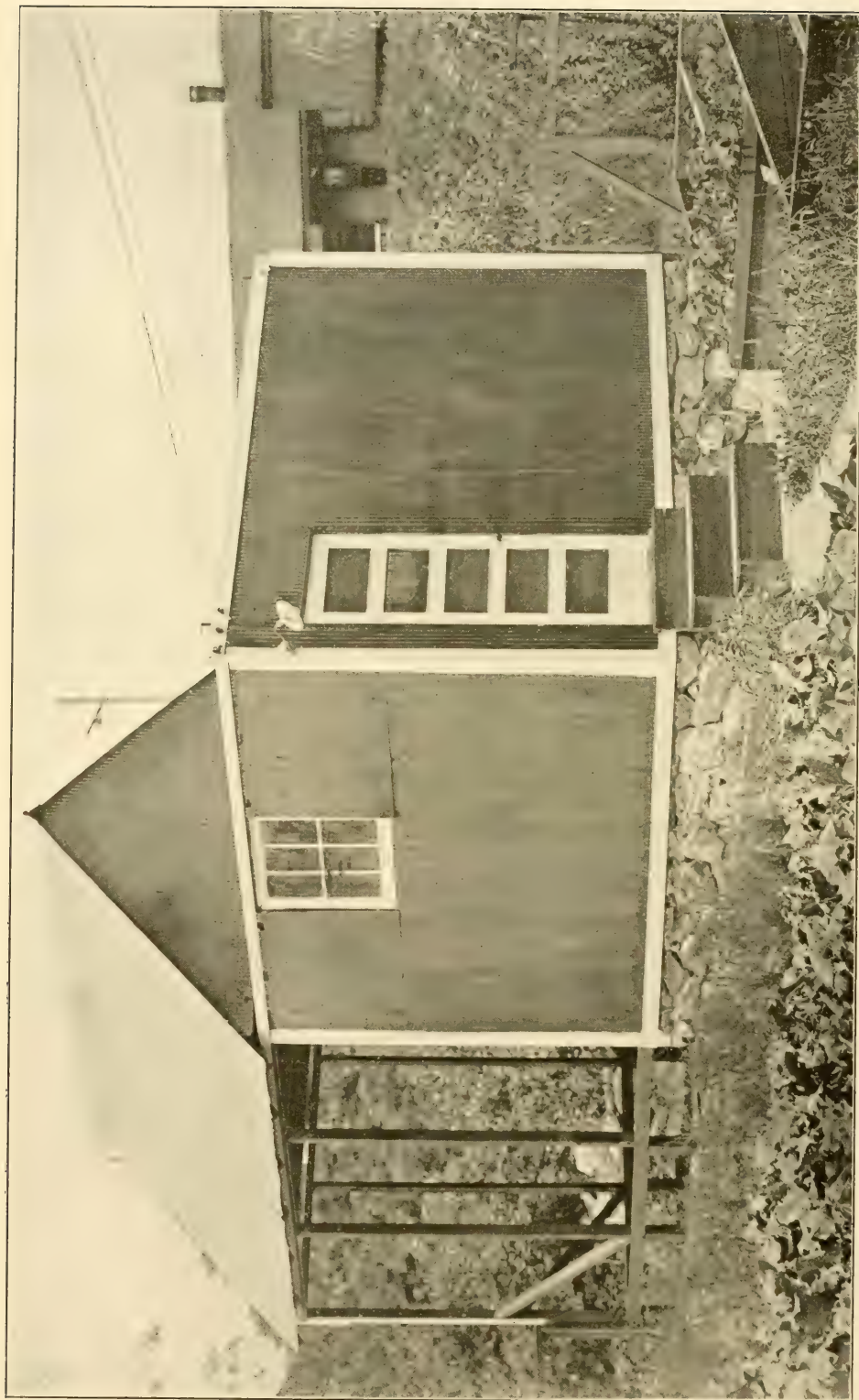
Mr. Fosdick is the leader of a local group of amateur astronomers. From a newspaper clipping sent to us by him we quote as follows:

"The latest mechanical genius that has been discovered in this city is John Wallace, sixteen years of age, a sophomore in Steele high school. The lad who is the son of Clinton Wallace, of the Rotterman building, has just constructed a telescope—an instrument that such a well-known

He conceived the idea while studying astronomy, although there was nothing brought out in the classroom that would provide the directions for making the telescope.

"He began his work some time before Christmas and worked on Saturdays and at various times on week days, when he wasn't occupied in doing other things, until he had completed the instrument. Everything was carried on in his father's garage. He consulted Mr. Fosdick at various stages of the work, but he performed the actual labor himself.

"The tubes are of common sheet iron. There is a silver glass mirror at one end and an eyepiece at the other end. He bought the glass for the lens and ground it himself. The tube is one hundred inches long and seven and one-half inches in diameter. The mirror is six and one-half inches in diameter.



THE SECOND BEACH OBSERVATORY.

The building, constructed mostly of iron, is completed and paid for. The roof may be easily rolled on or off in half a minute. The upper part of the sides are almost instantly removable. We need only about \$400 more to place the telescope in position. Let us have a good one soon.

The Starry Heavens in September.

BY PROF. ERIC DOOLITTLE, OF THE UNIVERSITY OF PENNSYLVANIA.

THOUGH the most brilliant constellations of the heavens have all now left us, the evening skies of September are wonderfully beautiful. The Milky Way now passes through the very zenith, its golden arch extending from the northeast to the southwest, its succession of most interesting

which was to the Persians one of the four Guardians of Heaven; and in the northeast we again welcome the group Perseus, with its wonderful variable star, and the bright Capella, that sun so like our own but so very much larger and brighter.

Vega, the autumn star, has now just passed the highest point of the heavens; Arcturus, whose red color contrasts strongly with Vega's brilliant blue, is still high up from the ground in the



Fig. 1. The Constellations on September 19 P. M.
(If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

star groups, no less than its own wonderful and intricate structure, forming an object of endless interest for exploration and study.

The September Stars.

The remarkable and striking summer group, Scorpio, is just sinking from the evening skies, while appearing in the east to take the place of those constellations which have withdrawn since last month, we see only the very faint Aries, Pisces and Cetus. But just below these there has appeared the brilliant Formalhaut, the solitary star,

west, while, most conspicuous of all, we see the brilliant Jupiter shining out with its golden radiance in the south. The four best-known objects for a very small telescope—the Nebula of Andromeda (at A, Figure 1), the Cluster in Hercules (at B), the double cluster in Perseus (at C) and the remarkable "Demon Star" (at D)—are all in favorable position for examination. The eclipses of Algol can only be observed toward the end of the present month, since the earlier ones will occur during the daytime. The times of the star's

greatest faintness are roughly as follows: September 24, 1 A. M.; September 26, 10 P. M., and September 29, 7 P. M.

The Planets in September.

Mercury may be detected low in the twilight glow throughout almost the whole of the present month. On September 1 it sets almost exactly due west, about one hour after sunset, while on September 27 it reaches its greatest

and a little below the planet Mars. It rises far in the northeast about four and one-half hours before sunrise on September 1, and this time is increased five and one-half hours by September 30. The reader who chooses to observe during the early morning hours will find that both of these planets are excellently situated for study, while at this time he will also see the brilliant Jupiter low in the southwest.

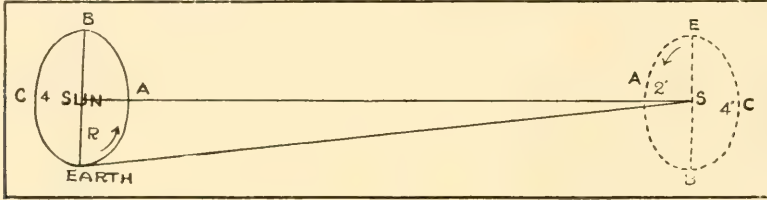


Fig. 2. Measuring the distances of the stars. As the earth moves around its orbit, ABC, a nearby star seems to move about a similar orbit, ARCE.

elongation, by which time, however, it will have moved much farther toward the south point of the horizon.

Venus passes the sun on September 12 and enters the evening sky, but throughout the month it is far too near the sun to be satisfactorily observed.

Mars is daily becoming more conspicuous in the eastern heavens before sunrise. On September 1 it rises four and one-half hours before the sun, and its own eastward motion among the stars is so rapid that this time is increased only to five hours by the end of the month. This planet is now near the summer solstice and so rises as high in the heavens as does the sun in mid-summer. It is approaching the earth, its distance diminishing from 163,000,000 to 147,000,000 of miles during September, and its brightness is consequently steadily increasing. It will be seen shining as a reddish, first magnitude star.

Jupiter will at once attract attention in the southeast, just below the Great Square of Pegasus. This world is now slowly retrograding among the stars and moving slowly downward and westward from the Vernal Equinox at V, Figure 1. The most numerous phenomena of Jupiter's satellites will be seen to occur on the evenings and nights of September 2, 7, 14, 23, 25, and 30.

Saturn is in the morning sky, lying, on September 1, six degrees to the east

The morning skies are thus far more brilliant at present than those of the early evening.

The moon, which passed over the bright star Antares, at E, Figure 1, on the 18th of last month will again occult this object on September 15 at 3 A. M., and in the course of its regular journey around the heavens it will again hide this star from view on October 12. But, unfortunately, these interesting occultations can only be seen by observers who are near or below the equator of the earth.

The sun will pass the Autumnal Equinox on September 23 at 10 hours 24 minutes 12 seconds P. M. (Eastern standard time,) and at this instant autumn will begin. It should also be noticed that we are now drawing near to the time of a sun-spot maximum. The observer who examines the sun's disc will therefore almost surely notice several spots upon its surface, and the probability is that a few of these interesting objects will be seen which are of an unusually large size.

Measuring the Distances of the Stars.

When the great astronomer Copernicus, more than 350 years ago, announced his discovery that the earth is not fixed but that it is moving around the sun, this new and startling idea was opposed even by scientists, on the strictly logical ground that such a motion of the earth must certainly cause an apparent displacement of the stars

on the sky. Just as when one is walking through a wood or riding on a railway he sees all objects apparently moving past him in a direction exactly opposite to that in which he is going. The nearer objects, because they are nearer, appear to move the most rapidly, while those which are very distant may seem to be moving very little indeed.

observations were begun with the most accurate instruments that had then ever been constructed in order to see if any such displacement could be found, but apparently no trace of it existed. The reason is that the stars are so very far away that the greatest displacement of even the nearest of them is quite too small to have been detected with these

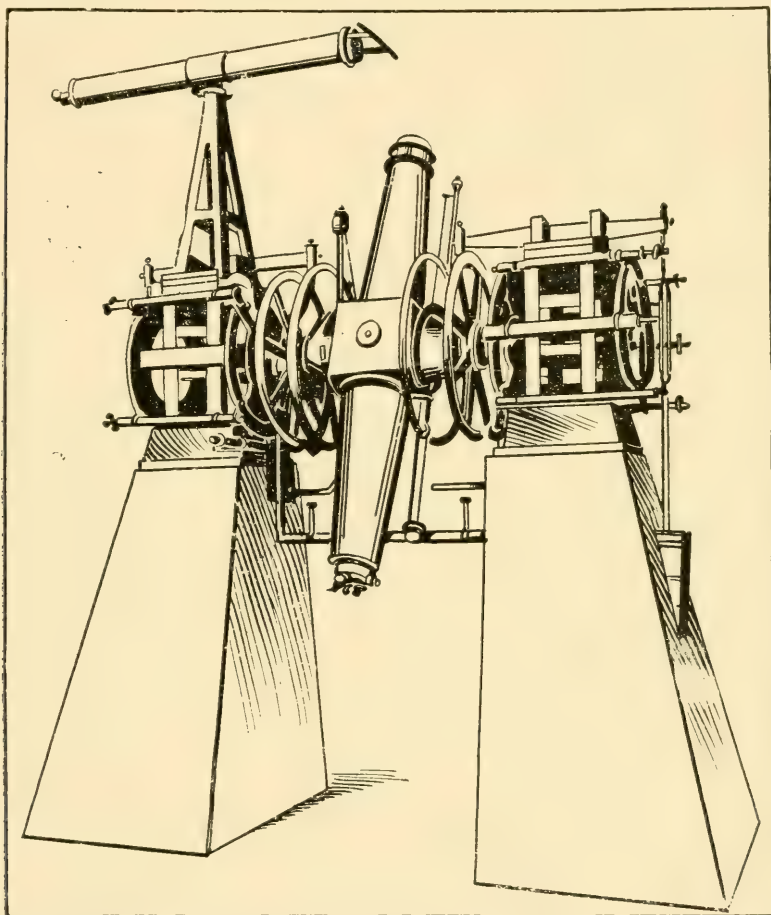


Fig. 3. The Meridian Circle in the United States Naval Observatory, Washington. An instrument for determining the positions of stars on the sky with high accuracy.

In exactly the same way, if the earth is really passing around a circular path, any star should seem to be moving in direction exactly opposite to that in which the earth is moving at the instant of observation. A little reflection will show the reader that the total effect of this apparent motion of the star will be to cause it to apparently describe a small closed path in the heavens, completing its circuit about this path in exactly one year.

Three centuries ago most careful

early instruments. In fact, very nearly all of the stars are so distant that even in our most accurate instruments they seem not to be displaced in the slightest degree while we on the earth change our position 186,000,000 of miles in going from one side of our sun to the other. If in the course of all this journey a star is displaced in its position on the sky by the thickness of the finest spider thread, we can measure the displacement and so find the distance away of the star. This work illustrates

probably better than any other the extraordinary accuracy of modern astronomical observations.

There are several different methods employed for measuring these excessively minute displacements. The most direct one is to actually measure with the so-called Meridian Circle the successive positions of the star on the sky—that is, its distance above or below the Celestial Equator and its angular distance from the Vernal Equinox. If it is found that the point of the sphere occupied by the star does not remain constant but that it apparently moves along a little elliptic curve, we know that this apparent motion is wholly due to the nearness of the star. The nearer the star is to us the greater will be its displacement; the computation of its absolute distance from the amount of its displacement is a very simple matter.

Another method now very extensively employed is to measure the position of the nearer star with reference to one or more stars which are so infinitely far away that these so-called comparison stars will not seem to move at all as we move around the sun. This can either be done by direct measures at the telescope or, as is now more usual, by photography. If at several different dates a very small region of the heavens about the star whose distance is to be measured is photographed and if the plates are then carefully measured under a microscope, a displacement of any one star can thus be found with reference to the others.

It is in this way that the distances of the nearer stars are measured, and the results are so enormous that they overwhelm the imagination. We find that there is no star so near that the light with which we view it, though traveling with the inconceivable velocity of nearly 200,000 miles a second, has occupied less than several years in coming to us, while many even of the brighter stars are no less than 100 light years away.

And it is still more remarkable that many of the very bright stars of the sky are so remote that they undergo no displacement arising from our motion about the sun at all. It may be that their light has occupied thousands of years in coming to us, and it is certain that they are as far as 100 light years

away. The brilliant Arcturus now so conspicuous in the western sky is one of these. This star is certainly many thousands of times brighter than our sun, for though it seems so bright to us it is so infinitely remote that its distance cannot be measured.

Truly the great cloud of suns which surrounds us is of so enormous a magnitude that our whole solar system seems to shrink into nothing in comparison with it.

The Ennobling Effect of Astronomy.

Dr. Brashear recently spoke at the annual banquet of the Providence Society of Mechanical Engineers. From an account of his address published in "Popular Astronomy" we quote the following:

"In closing, Dr. Brashear spoke of the lofty and ennobling influence which the study of 'the supreme science' has upon the human mind and soul, and spoke of a well-known millionaire, whose son was not all that his father desired him to be. The father had gone to Dr. Brashear and asked him to take the son into the Observatory, and show him some of the marvels to be seen through the telescope. This the Doctor had done, the young man had become interested in the study, and the inevitable ennobling effect had followed. The young man is now one of the most highly respected men in the city where he lives."

C. C. Georgeson, of the United States Department of Agriculture, has been doing some special work on the native wild fruits of Alaska with the hope of breeding new cold-resistant varieties of the cultivated species. Already he has produced nearly four thousand hybrids between the cultivated strawberry and wild sort that grows along the Alaskan coast. Other crosses between exotic and native raspberries, gooseberries, and currants have thus far been less successful. There is also a wild Alaskan crab apple which it has been hoped to cross with some of the hardiest of our northern cultivated sorts, since even the most resistant of these latter are grown only with the greatest difficulty so close to the Arctic Circle.



Stop, Look, Listen

Young man, young woman, there are two roads of life. Over one you may travel in peace and calm, over the other you may rush forward with a speed that will finally crush you to pieces. Take the quiet road of mental rather than that of material things. For a time you may seem to have a grand good time in rushing from tango to bridge whist and the cabaret. There is hilarity in speeding up to seventy miles an hour. Nobody can dispute that. But the best things in life are not obtained at any such reckless speed. There is an advantage in a crowd; one can there forget for a time everything but the joy of life; but reaction must come. One cannot be continuously in a crowd. Our isolation becomes more and more complete as the years go by. Long ago a great writer said God has set the solitary in families, and He has set the lonely in communities, which are just larger families. Learn to have resources in yourself, depend less and less upon fellow beings. The resources of nature and of books are more permanent and ever more readily available than are the sources of hilarity. Mental things are more enduring and satisfying than material. Happiness after all is only a state of mind. It is easier and pleasanter to keep a quiet mind than to be in a perpetual ferment.

This may sound like preaching. Perhaps it is a sermon, but the advice is good. Acquire the habit of being pleased by small things and by home friends. Not many friends are required to make life happy, but they must be true, congenial and sympathetic. One may have a feeling of friendship and a kindly feeling for a number of people, but happiness does not depend upon the cultivation of hilarious joys amid the multitude. Learn to love the trees, the birds, but learn more thoroughly than all else to be on friendly terms with yourself in your quiet moments.

An Ideal for Girlhood.

Our whole idea of woman's charm and woman's place was conceived by men. The Englishman, well, we will say up to the nineteenth century, was a gallant where woman's "charm" was concerned and a brute where her "place" was concerned. Under their training, woman herself uses the same terms in describing herself. It does not seem to occur to her that the conception was man-made, though she may have, as a girl, wept bitter tears over the freckles which she believed robbed her of her charm. We are beginning to resent the implication, and to insist that woman's charm is the same thing as man's charm. It does not depend upon a woman's hair and eyes and complexion and willowy figure any more than it depends upon a man's drooping moustache and melancholy eyes, or that "genteel figure" which Kate Hardcastle so much admired. Her real attraction is not that subtle thing which makes her desirable to men, but that nobility which makes her attractive to God and to mankind. It is the way in which she uses her faculties, her opportunities, her perceptions that makes her a force in the world.—Alice B. Macdonald in "The Educational Review."

A Work of Great Value.

I see a high work in turning the eyes and faculties of the youth to Nature as a means of laying a moral, intellectual and spiritual foundation that will be wholesome, sane and safe. I believe our Infinite Father had this in mind as well as the practical and material when He formed our environment. In many instances I have been able to trace an extraordinarily sweet, mild and gentle disposition back to a foundation laid in Nature communion.—Will Webb Tuttle, Muncie, Indiana.

Distinguishing Male from Female Canary.

(IN REPLY TO AN INQUIRY.)

The male can usually be distinguished from the female canary by the fact that it only sings. The young males usually begin to sing even in the November or December of the year in which they have been hatched. If the female sings it usually does so far less perfectly than the male. The only absolute criterion is that the female lays eggs and the male does not.—Charles B. Davenport, The Biological Laboratory, Cold Spring Harbor, New York.

The Protozoa, remarks a recent writer should not be called "unicellular" but "non-cellular."

The Fascination of Fasciation.

No abnormal plant growth seems to attract more general attention than fasciation. For most people fasciation has a decided fascination. Fasciation occurs frequently in asparagus, hyacinth, goldenrod and other strong plants. The growths are hereditary in the cockscomb or *Celosia*. The causes of this growth are not known, but something goes wrong, there is somewhere a kink that leaves a kink in the whole stem. Profes-

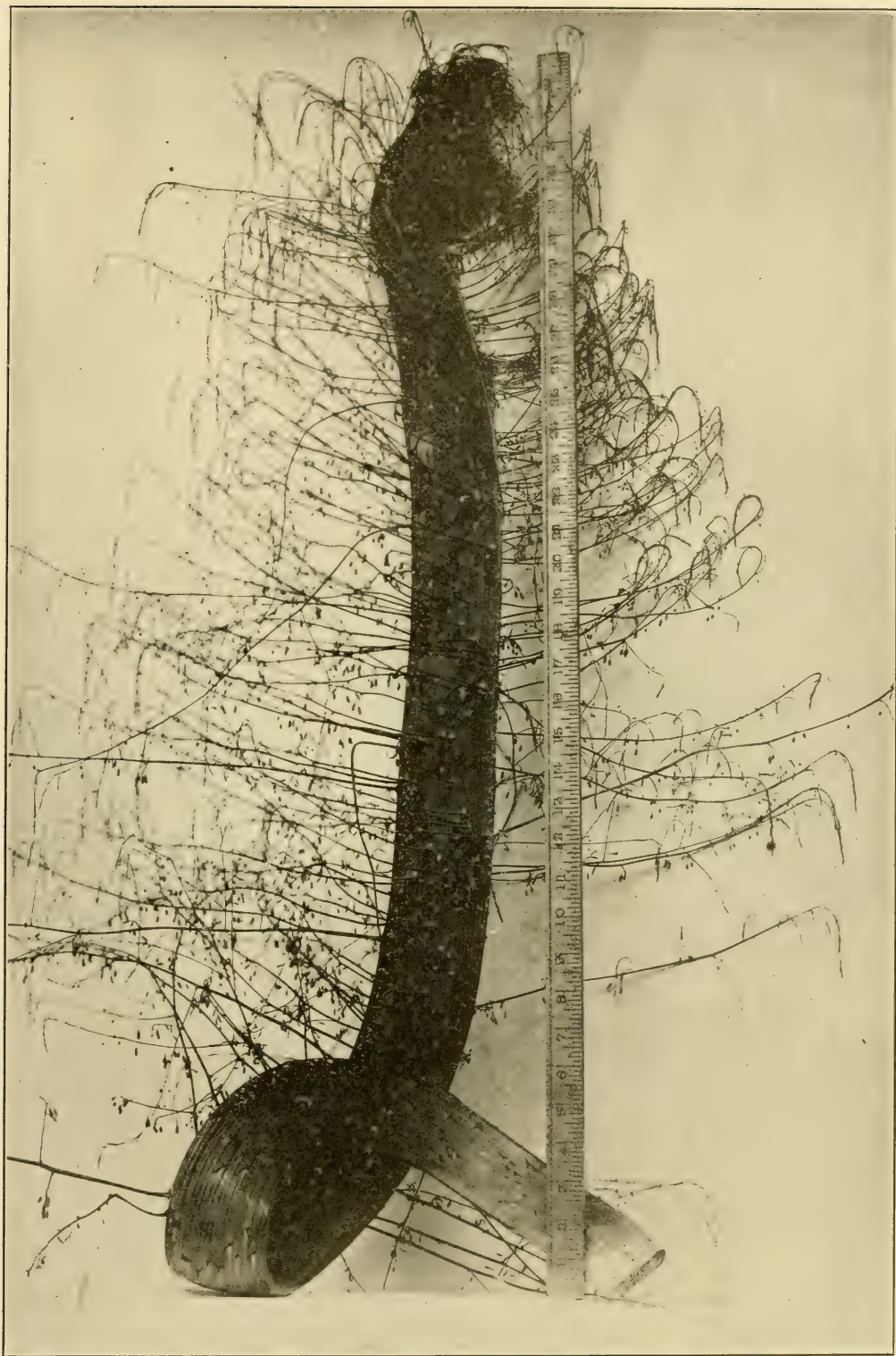
sor William F. Ganong writes as follows:

"Fasciations can also be produced, by the way, by external injury, such as the bites of some insects, though when produced in such manner they are not hereditary. They are of all degrees of complexity, down to a simple forking of the growing point, which may sometimes result in the formation of double fruits, though these are more often the result of the fusion of two buds in a sort of natural grafting. It is obvious that such fasciations come very close to the condition which originates the Birdseye Maple or rather that the latter in reality is a kind of fasciation. It is perfectly impossible to draw any sharp line between these different forms of clustered abnormal growths, or between external and internal causes of their formation."

Of all the examples that have come to ARCADIA an asparagus stem presented recently by Mrs. Frederick Gotthold of Cos Cob, Connecticut, a Member of The Agassiz Association and close student of nature, is surely entitled to first premium. The stem is three inches in width or a trifle more in some places, and the fascinated growth itself stands the length of a yard stick and yet if the stem were straightened out it would be fully five feet long.



ASPARAGUS FASCIATION SENT BY MR. H. E. DEATS, FLEMINGTON, NEW JERSEY.

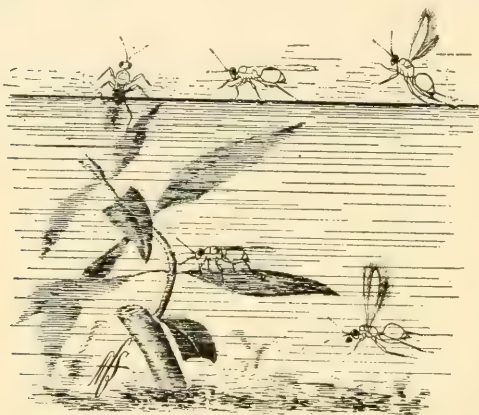


A MOST ASTONISHING SPECIMEN OF ASPARAGUS FASCIATION FROM MRS. FREDERICK GOTTHOLD, COS COB, CONNECTICUT.

Insects that Swim under Water.

Professor C. R. Crosby, of Cornell University, recently discovered an interesting insect (*Caraphractus cinctus* Walker) that swims under water in the adult or imago stage, by the aid of their wings. He says:

"The adults of this species seem perfectly at home under water and swim quite rapidly by means of their wings



THESE INSECTS ARE AT HOME UNDER WATER AND SWIM BY MEANS OF THEIR WINGS.

with a jerky motion, corresponding to the wing strokes made at the rate of about two per second. The legs are trailed behind and are not used in swimming. They spend much of their time walking nervously over the stems of submerged plants, the surface of which they examine carefully with the tips of their antennae, as if searching for eggs in which to oviposit. They are able to walk on the sides of the glass aquaria and on the under side of the surface film. After transferring a jar of water containing these parasites from one building to another a number were found on the upper side of the surface film in the air and flew across the surface trailing their legs attached to the film. They emerge from the water by crawling up some object and forcing their way through the surface film.

"We have been unable to see any external air supply carried by these insects while under water. While submerged they appear to be perfectly wet but as soon as they emerge into the air they seem to be perfectly dry. They are able to live submerged in water for over 12 hours in a bottle filled full of water and corked."

This is practically the same as *Polynema natans* about which Lubbock of England published fifty-two years ago. Quite a number of aquatic insects can fly in the adult stage, but do not use their wings for "flying" through water. They swim by aid of their flattened legs.

Can any of our readers give information of any other insect that "flies" under water?

A Killdeer Assists a Farmer.

Stamford, Connecticut.

To the Editor:

A killdeer, or ring-necked snipe as it is called on the eastern end of Long Island, selected our asparagus field as her home. The bird does not make a nest, but lays her four eggs anywhere on open ground in the sunlight. The size of the eggs is wonderful. The bird in body is smaller than our robin, but her eggs are three times the size of the robin's. I am sorry we did not take a photograph when the bird was near the eggs. As we had to cultivate the field, it being a young peach orchard, the trees eighteen inches high, the birds became used to us although they did not cover the eggs in the middle of the day, if the weather was clear. I think two weeks were spent in hatching, but I am not certain. The result was a bill, two legs and a ball of down. The young birds could fly in two weeks. What the old birds did for me without pay, if I put a pecuniary value on their labors, would have been worth about twenty dollars. They kept an acre of asparagus clear of the asparagus beetle for the season, by eating them all, with how many other bugs I do not know. They now have a lease of the place for as many years as they will take it. The young birds have left for the South; the older ones will go in a few days. Why the young go first with other young birds I do not know, but as I have gunned on the eastern end of Long Island for years, I do know that the young flight comes first, and as a rule on August first. The flight of the old begins about two weeks later and lasts till the first of September. I have shot many ring-necked snipe, calling them to stool by a penny whistle, and have thus destroyed many cheap laborers that would have helped the farmer.

Yours truly,

ROBERT L. CASE.

Centipede and Young.

BY H. STUART DOVE, WEST DAVENPORT,
TASMANIA, AUSTRALIA.

In December last (midsummer with us in Tasmania), while splitting some partly decayed gum logs on my land, I exposed to light, in a niche in the wood, a large greenish centipede, about three inches in length, curled round about twenty young ones. The young were each nearly one-half inch long, whitish, almost transparent and delicate in appearance. The mother would not desert them in spite of the uneasiness caused by the sudden exposure of her home to the strong sunlight. The shock of the axe having caused a partial dispersal, she gathered them again as well as she could and curled snugly around them. I thought this was so fine an instance of maternal care under untoward circumstances, that I gathered the family on their piece of gum log and placed them under shelter where they could mature and be undisturbed.

Strange Vegetation of the Sea.

BY MAME BUXTON, REDONDO BEACH, CALIFORNIA.

Visitors to the beaches of Southern California view with wonder and surprise the strange marine vegetation that is washed up on the shore by the fury of the waves during a storm. While there

are many beautiful and curious specimens of seaweed the giant kelp is the most wonderful. Its striking peculiarity is the bulb or air sack that gives the plant sufficient buoyancy to float on the surface of the water. The foliage, resembling antlers, grows out of the top of the bulb, and the plant is anchored to the rocks at the bottom of the sea by a cord-like appendage that is sometimes 300 feet long. It is said to be the longest plant in the world. The growth of the kelp is sometimes so extensive as to form a natural breakwater, and sometimes endangers navigation.

The value of kelp as a fertilizer has led to investigations by the Department of Agriculture with the view to arousing interest in the commercial possibilities. Germany has furnished the potash used in the United States, and now that the supply is cut off doubtless manufacturies will soon be erected along the Pacific coast for the production of potash from these plants, as well as iodine. The kelp is sometimes used medicinally in glandular affections on account of the iodine it contains.

"The man who tamed the blueberry, Frederick V. Coville, has been trying his hand at the still wilder Mayflower. He reports that the two plants are much alike in their requirements, since each demands a "sour" soil that has never been treated with lime, manure or chemical fertilizer. The fruit of the Mayflower is a small edible berry not unlike that of the wild strawberry, but much smaller, and ripening about the same time. This must be collected by searching under the leaves in June or July, and promptly sown in a mixture of one part clean sand with two parts upland peat, preferably from laurel thickets. The young plants are repotted from time to time, and after exposure to winter cold are ready to bloom the next spring. Under cultivation the blossoms are much finer than in the wild state.

A recent German authority maintains that the irritant of the nettle is not, as has commonly been supposed, formic acid, but a substance of at least the general nature of the proteins resembling in many respects an enzyme. In other words, the poison of the nettle not unlike that of the cobra and rattlesnake.



THE GIANT KELP IS THE MOST WONDERFUL OF SEaweEDS.

A Milk Snake Mimicking a Rattler.

Andover, Mass.

To the Editor:

I have just had an adventure which seems to cast doubt on the statement of the natural histories that the common milk snake confines its mimicry of the rattler to its coloring and the trick of shaking its tail. I found a milk snake, some two feet long,, which on being annoyed struck viciously at my foot some half dozen times, the blows coming in rapid succession and so hard that I felt the jar through the thick boot-sole which I presented to his attention. Finding he made no impression on the leather, the animal tried apparently to reach my shin by shooting straight up into the air nearly half his length. This he repeated three or four times. Meanwhile he kept his tail going like the clapper of an alarm clock.

In fact, the whole imitation was so very convincing that I began to wonder whether I might not myself be mistaken. And so, the chance for observation not being at all good, I killed the animal, to be on the safe side. There proved to be neither rattles nor any sign of fangs. It was beyond all doubt just a common milk snake.

Now I wonder whether the books are wrong or whether this sort of perform-

ance is really uncommon.

Yours very truly,

EDWIN TENNEY BREWSTER.

Upon referring the above to Raymond L. Ditmars of the Herpetological Department of the New York Zoological Park, he writes as follows: "The only indication of mimicry is in shaking the tail. Form of body and coloration are rather unlike the rattlesnake. The greater number of the harmless snakes vigorously put up a defence when cornered and strike at the enemy."

Decorative Fish Eggs.

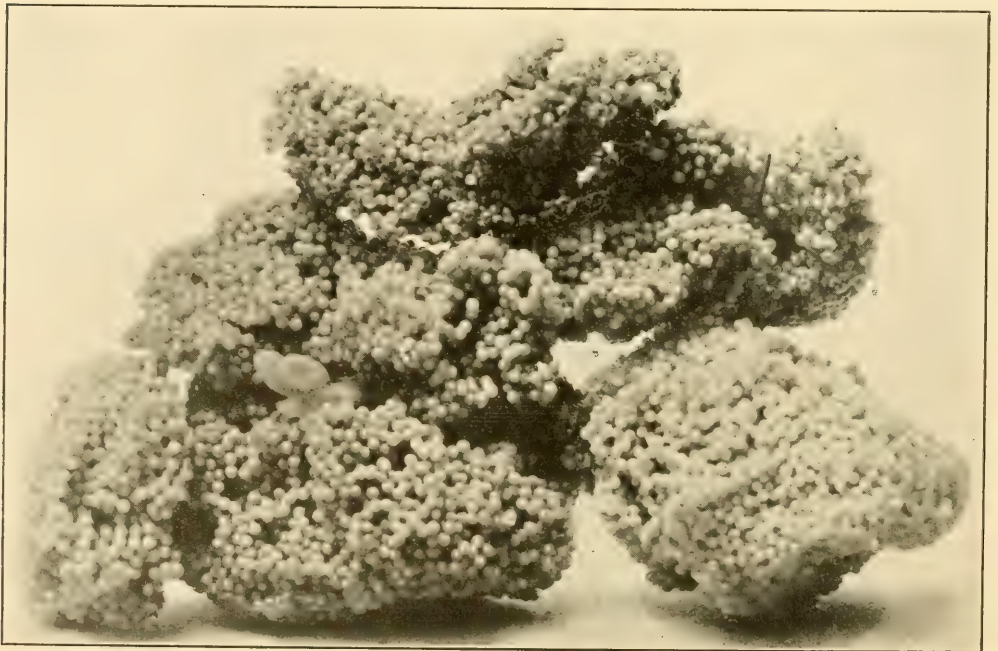
Ocean Grove, New Jersey.

To the Editor:—

I send with this letter a small box containing what I take to be the eggs of some marine animal. I have found them before, but have never been able to learn what they are.

During a storm large numbers of them were cast on the beach. The colors of the different clusters were so varied and so beautiful that they attracted considerable attention.

I wish I could send you a picture of some of the clusters which I have arranged in water in a glass dish. The colors run through various soft shades of brown and green, some having a



THE DECORATIVE FISH EGGS.

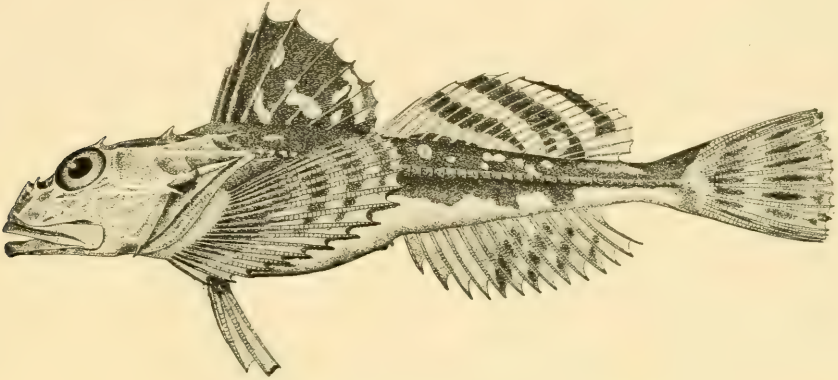
reddish and some a purplish tinge, like amethyst. One cluster is firmly attached to one of our common finger sponges, which rises out of the center in a pretty way.

Very truly yours,

EMMA VAN GELuwe.

The dried eggs appear to be those of

point—considers them vermin and legitimate prey. The hunting instinct seizes everyone at the Lodge, and when a brown object is seen in a distant field or orchard, Mr. Burroughs seizes his rifle and creeps toward the railing of the porch. Usually the woodchuck, understanding conditions perfectly, notes the



THE EIGHTEEN SPINED SCULPIN.

the eighteen spined sculpin *Myoxocephalus octodecimspinosus* (Mitchill), the common sculpin of our coast which lays its eggs in masses attached usually to seaweeds in shallow water. In storms these often wash on shore in great numbers.—Raymond C. Osburn, Assistant Director, New York Aquarium.

John Burroughs, Woodchuck Hunter.

Mr. Albert Houghton Pratt has an interesting article in a recent number of "The Outlook," descriptive of his visit to the home of John Burroughs, at West Park, New York. Among the illustrations is a full page of Mr. Burroughs as a woodchuck hunter. Most of us think of this famous naturalist as an observer rather than a shooter of animals, but it appears that between him and woodchucks there is a point where patience ceases to be a virtue. When the woodchucks become a pest, Mr. Burroughs does not hesitate to get after them with his rifle. Mr. Pratt writes as follows:

"Woodchuck Lodge lives up to its name. The reason for its being so called is apparent on all sides, and is never lost sight of. Woodchuck holes are visible everywhere. Mr. Burroughs—looking at woodchucks from the farmer's stand-

movement, even if a hundred yards away, and disappears into his hole. If, however, he is seen over the barrel of the gun—it usually means one woodchuck less. One day I saw Mr. Burroughs dispose of five of the rodents with six shots. This warfare does not tend toward extermination, for notwithstanding it the woodchucks are as numerous as ever.

"So, whether trying his skill as a marksman on woodchucks, contemplating nature, or thinking and writing about the new discoveries in chemistry and the new conceptions of matter, the best days of the year for Mr. Burroughs are those spent at Woodchuck Lodge."

Mr. P. J. O'Gara, American Smelting and Refining Company, Salt Lake City, Utah, is interested in white English Sparrows and asks for notes on their occurrence in normal flocks.

Dr. Otto Appel, of the Berlin, Germany, Agricultural Experiment Station, finds that the different resistance to disease of various sorts of potato depends largely on the rapidity with which small wounds heal. Some varieties begin to "skin over" a wound in six hours, while others let it remain open for forty-eight. The former, therefore, may escape infection to which the latter succumb.

The Rattlesnake's Worst Enemy.

Aiken, South Carolina.

To the Editor:—

Some years ago while I was riding in Atascosa County on the Frio River in southwest Texas, a rattlesnake crossed the road about twenty-five yards in front of me, and looked back as though he were being pursued. He paid not the least attention to the sounds of the horse's hoofs, although as a rule rattlesnakes will coil at any sound and prepare for fight. To see what was going on I stopped my pony. The rattler had not advanced more than fifteen or twenty feet, when a blacksnake appeared. I knew that a blacksnake will kill and swallow any other kind of snake, so I waited to witness the struggle. In a cleared space in the mesquite, a few steps from the road, the rattler was coiled ready for the battle that he seemed to know must be fought. With his rattles hissing, a menace and warning to man and beast, his eyes glaring fiery hate at the enemy, he waited.

The blacksnake, his head slightly lifted, his eyes on his victim, approached the edge of the clear space. With a slow and deliberate movement he circled around his enemy. Faster and faster he made the round, and the rattler followed the movement with his head—faster and faster until I could see only a black streak and a film of floating dust. The rattlesnake's head steadily followed the moving streak. A sudden silence. The blacksnake had crossed the circle and was eyeing his victim that was again coiled, his head showing signs of weakness, and his rattle only faintly hissing. In the twinkling of an eye, the blacksnake caught him behind the head, and coiled himself around the rattler and stretched himself until I heard the rattler's bones crack and snap. When the blacksnake made the dart at the rattler, the latter struck himself on the back, pouring all his poison into his own body.

Then I went my way, knowing that I had that day seen a battle that I was not likely to witness again.

W. D. KERSHAW.

Report comes of the finding of a mastodon tusk in glacial gravels, twelve miles southwest of Ithaca, New York. The fossil has been presented to the Cornell Museum.

What "The Evening Star" Says.

"The Star" today has given over considerable space to the annual statement of the Agassiz Association because "The Star" wants to help along Dr. Bigelow and the others who are engaged with him in his work at ARCADIA.

The public ought to read every word of the statement and those of the public who can afford it should put their hands down in their pockets and "shell out." The Agassiz Association or AA as it is abbreviated is doing a good work, a public work, and one that the public ought to appreciate.

There are many institutions in Connecticut receiving regular grants from the general assembly each year. Many of these are much less worthy than the AA's ARCADIA at Sound Beach.

This matter should be put up to the next general assembly.

Until then the institution must continue to rely upon the public as a whole. If anybody doubts the statement that the AA is a thing that should be encouraged, let him go to Sound Beach and visit ARCADIA. If he goes to scoff he will remain to pray. There isn't another thing like it in Connecticut, perhaps not in the country.

It is invaluable—or could be made so—to the school children in this section of the state. Nature study is part of the curriculum of the schools. Botany is taught in the High school. If these budding botanists would go to ARCADIA to supplement their "book-learning" they would get a new idea of nature and its wonders.

To sum it all up, ARCADIA is built for use. It can be used by anybody who has a serious wish to study nature. It is not, as a matter of fact, a playground, although part of it is ideal for that purpose. It is a place for serious work, and it is up to students of nature to interest themselves in its opportunities and then they will be able to share its responsibilities.—The Evening Star, Stamford.

The famous Zoological Station at Naples, among the oldest and best equipped institutions of its sort in the world, is in a serious condition financially owing to the withdrawal of German support. It is proposed that the American universities take up the places in the laboratories left vacant by the nations at war.

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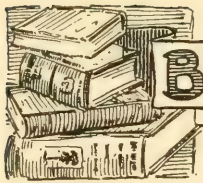
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BOOKS and MAGAZINES



A Popular Handbook to the Microscope.

By Lewis Wright. London: The Religious Tract Society.

This is the only book on the microscope published from the standpoint of religious interest that has come to the reviewer's desk. The author says:

"The Microscope, then, has deserved well of the Christian believer; and it is to be hoped that this may not be the last work the Religious Tract Society may see fit to publish concerning the marvels it unfolds to us, upon which part of the subject very limited space has prevented any enlargement in this little volume."

This is indeed a good point of view and merits hearty commendation from our Association whose motto is "Per Naturam ad Deum." The book is up-to-date, convenient, and contains good material in concise form.

Love and Service of Country.

By Frederick J. Gould, 17 Johnson's Court, Fleet Street, E. C., London, England: Watts & Company.

This booklet of some thirty pages has just reached America. It is one of the strongest and wisest little books that the

war has brought forth. In the preface we read:

"The European War of 1914-15 has concentrated the mind of the world, by a sad necessity, upon the military forms of patriotism. The present pamphlet seeks to emphasize the non-aggressive aspects of love and service of one's country."

The true scientific method in bringing out "love and service" is shown in this pamphlet. To be conscious of keen patriotism in the activities of life is noble, but let patriotism prove grander results than through bloodshed!

Mr. Gould is an English author and lecturer. He has devoted his life to pioneer work for humanity.

The pamphlet may be used by both teachers and speakers. It is filled with ideas for both old and young.

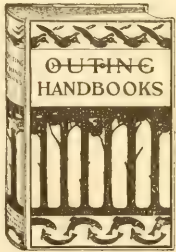
An Illustrated Catalogue of American Insect Galls.

By Millett Taylor Thompson, Ph. D. Published and distributed by Rhode Island Hospital Trust Company, Executor, in accordance with the provisions of the will of S. Millett Thompson. Edited by E. P. Felt, Nassau, Rensselaer County, New York.

This interesting publication was needed. It fills an important and previously unoccupied field. Its pictures of a large number of galls will be convenient in getting the names but it is to be regretted that more matter descriptive of galls has not been included to teach us something more about them. The book neglects to tell what a gall is.

Many years' experience with boys and girls has shown that galls are interesting objects to them. They are intrinsically interesting to everybody. Why does not some one write a book to tell what they are and to describe the insects that cause them, their life history as well as the structure of the plant malformation?

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The Guide To Nature

AN ENLARGED AND IMPROVED
DEPARTMENT

ORNITHOLOGY
IN THIS NUMBER
(PAGE 160)

IT IS EDITED
BY HARRY G. HIGBEE

13 AUSTIN STREET, HYDE PARK, MASSACHUSETTS

THE HEARTY COOPERATION OF ALL BIRD
LOVERS IS CORDIALLY INVITED

Vol. VIII
No. 5

October 1915

EDWARD F. BIGELOW
MANAGING EDITOR

Subscription, \$1.00 a Year. Single Copies, 10 Cents

GREENWICH

THE EDITION DE LUXE
OF CONNECTICUT TOWNS

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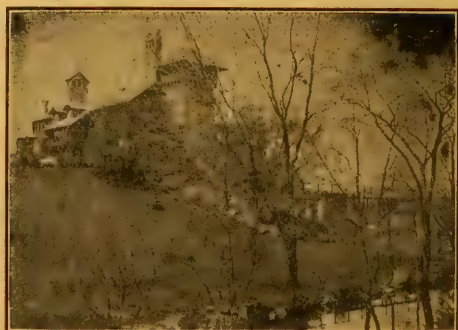
Under this term are several forms of service covered by The Greenwich Trust Company, such as: Administration of estates left without wills, receiver or assignee of enterprises in financial difficulties; agent for persons who want to be relieved of the management of their own business and property affairs.

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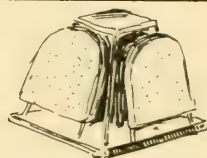
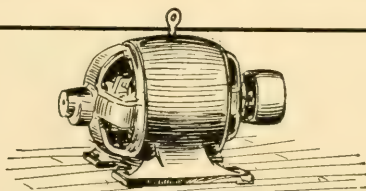
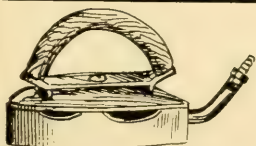
South Norwalk.



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When you and the "man next door" have those Sunday morning discussions, you differ on many points.

Makes of tires, brands of oil, body design, relative merits of fours, sixes and eights—all of these you can find arguments for and against.

But when you consider storage batteries you agree that the Willard satisfies all your requirements for starting and lighting. And nobody questions the value of Willard Service Stations—they have proved indispensable to owners everywhere.

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Everything Electrical.

The Egotism of Youth.

It was commencement evening. A youth rose to deliver his oration. His subject was "Light." He began:

"In the beginning God said, Let there be light: and there was light.' Now let us consider some of the modern improvements."—Canadian Monthly.

Less Than Human.

Tom, the country six-year-old, presenting himself one day in even more than his usual state of dust and disorder, was asked by his mother if he would not like to be a little city boy, and always be nice and clean in white suits and shoes and stockings. Tom answered scornfully: "They're not children; they're pets."—Harper's Monthly.

Interrupted Story.

Supper was in progress and the father was telling about a row which took place in front of his store that morning. "The first thing I saw was one man deal the other a sounding blow, and then a crowd gathered. The man who was struck ran

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and grabbed a large shovel he had been using on the street and rushed back, his eyes flashing fire. I thought he'd surely knock the other man's brains out and I stepped right in between them."

The young son of the family had become so hugely interested in the narrative as it proceeded that he had stopped eating his pudding. So proud was he of his father's valor his eyes fairly shone, and he cried:

"He couldn't knock any brains out of you, could he, father?"

Father looked at him long and earnestly, but the lad's countenance was frank and open.

Father gasped slightly and resumed his supper.—Lippincott's Magazine.



12 New Bulbs, 10c

Together with a Complete Treatise on the Culture of Hardy Bulbs both indoors and out, and our beautiful Catalogue—

- 1 Giant Calla, largest and finest.
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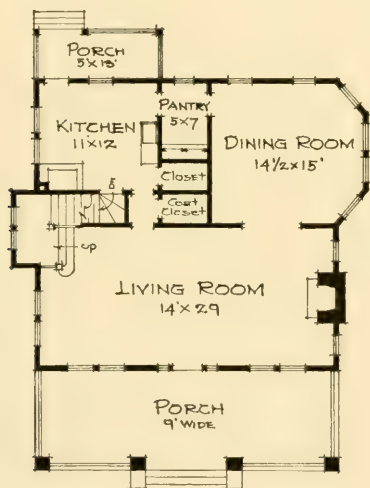
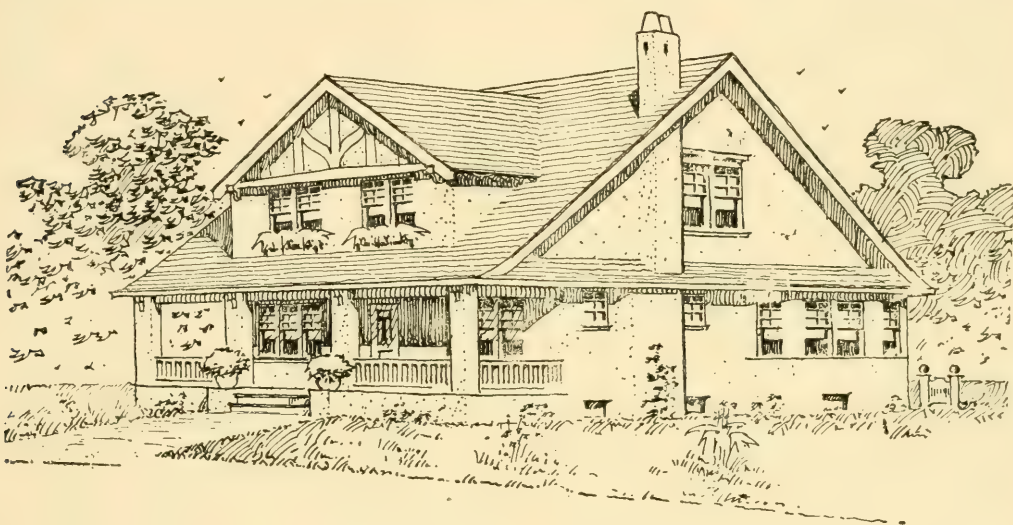
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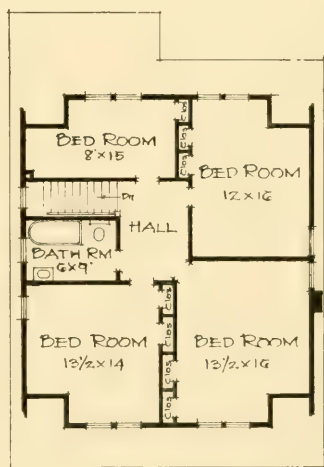
Homes Near to Nature.

THE GUIDE TO NATURE intends to publish a series of plans for suburban or country homes with estimates of cost.

architect to supply further information. We begin the series with a pleasing design and convenient arrangement for a home near to nature that can be built



FIRST FLOOR PLAN



SECOND FLOOR PLAN

Detailed specifications may be obtained by addressing this office. We have made arrangements with an expert

for \$4,175.

The exterior is of stucco, with shingle roof.

The first floor provides for a porch across the entire front of house, with a living room of exceptional dimensions provided with a fireplace.

The kitchen is almost square and connects with the dining room by a small pantry. Two good closets are also provided. There is a small porch at the rear.

The second floor is complete with four bed rooms, a fair sized bath room and a hall.

Following is an itemized cost of construction:

Excavation	\$150
Stonework	\$200
Brickwork	\$125
Carpenter work	\$800
Plastering	\$800
Lumber	\$600
Millwork	\$900
Painting and Glazing	\$150
Plumbing, etc.	\$200
Hardware	\$85
Hot air heating	\$125
Range	\$40

Total \$4,175



Tis not in mortals to COMMAND success, but we'll do more, Sempronius, we'll DESERVE IT.

—Addison: Cato

The Slingerland Insect Slides.

It is with special pleasure that we call attention to the advertisement in this number of the Slingerland lantern slides of insects. They are used at ARCADIA to the delight of the visitors that have seen them on the screen. They are colored true to nature and are sharply and clearly defined on the canvas. They are in every respect first-class.

High Awards for Dog Foods.

Gold Medal and Highest Award for dog foods at the Panama-Pacific Exposition has been given to Spratt's Patent, Newark, New Jersey.

Is this surprising when you are told that at three (3) shows recently, over 3000 prizes were won by dogs fed regularly and exclusively on Spratt's Dog Foods?

The products manufactured by this company have been on the market for over fifty years. During this period they have received the highest honors at all the principal national and international expositions, a convincing proof that merit wins in the long run.

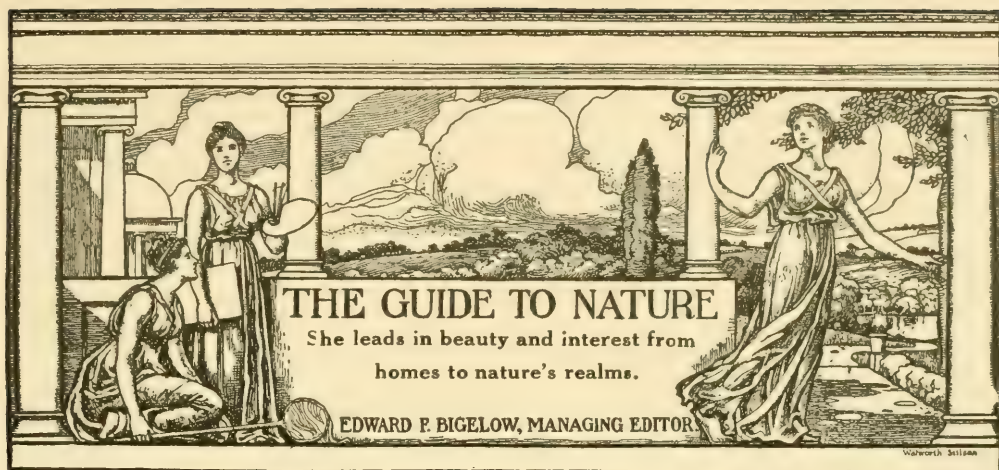
There are more prize-winners reared and fed on Spratt's Dog Foods than on all others combined.

Spratt's will bench and feed the Panama-Pacific Dog, Poultry, Cat and

Pet Stock Shows. These exhibitions are among the largest and most important held in this country and the fact that the contracts for all the above mentioned shows have been awarded to this well known firm speaks volumes for their up-to-date methods, efficiency, etc.

Get the Right Camera and Lens.

The Goerz hand cameras equipped with the Goerz lenses, the result of twenty-five years painstaking research work, are offered in a variety of styles and lenses. The editor believes that every form of hand camera, if the expense can be met, should be equipped with an anastigmat. The difference between the price of an ordinary lens and that of an anastigmat is large, but the result is well worth the increase. Good work is occasionally done with the simpler form of lens, but the anastigmat is the most satisfactory, and assures the largest percentage of success. The Goerz people have devised a camera that for convenience is ideal, and have equipped it with anastigmat lenses, because they are not satisfied with a moderate percentage of success but want every exposure to be the best possible. Send for their new booklet, "Goerz Lenses." Address C. P. Goerz American Optical Company, 317 East Thirty-fourth Street, New York City.



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Volume VIII

OCTOBER.

Number 5

A Well-Equipped Chemical Laboratory

By EDWARD F. BIGELOW, ARCADIA: Sound Beach, Connecticut

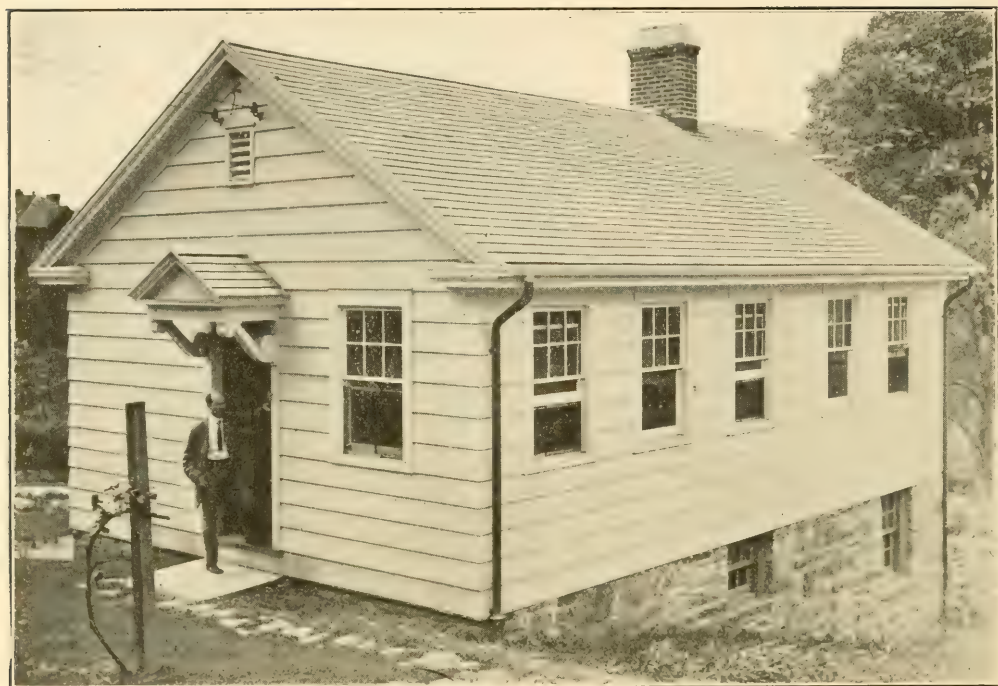
PROFESSOR Frederick H. Getman, for several years professor of chemistry at Bryn Mawr College, has decided to devote his time to original research in chemistry, and for that purpose has recently completed an ideally equipped laboratory on the steep hillside in the rear of his home on Glenbrook Road, and has very appropriately named it The Hillside Laboratory. The writer believes that not only locally, but generally, there is keen interest in this kind of work. For this reason we publish the accompanying photographs and this description of the laboratory and its equipment. Dr. Getman is well-known locally on account of his active interest in our Stamford High School as a teacher in chemistry and physics.

This Laboratory is a single-story building, thirty feet long and twenty wide. One enters it through a small vestibule into a well-lighted office where, in addition to the usual office furniture, is a library of about five hundred volumes bearing upon Physics and Chemistry, together with files of the more important chemical journals.

From the office, a doorway leads into the main laboratory, which is devoted to measurements of precision. Near the center of the room a marble slab resting upon two brick piers free from all vibration, serves as a support for an analytical balance and a cathetometer.

In this room are two stills, one for the distillation of the city water, the other for the distillation of the product from the first still. The distilled water obtained from the second still is of so high a degree of purity that its electrical conductance is only 0.000002 reciprocal ohms.

Among other special pieces of apparatus in use in this room may be mentioned a large electrically controlled thermostat bath, capable of maintaining its contents at any desired temperature between that of the room and 35°C., with a maximum variation of 0°.01; a potentiometer permitting direct readings of electromotive force to hundred-thousandths of a volt, and an apparatus for metallurgical photomicrography. An apparatus-case in the same room contains other fine specimens of the instrument maker's skill, such as a



DR. FREDERICK H. GETMAN OF STAMFORD, CONNECTICUT, AND HIS HILLSIDE LABORATORY.

wave-length spectroscope, a polarimeter and a refractometer.

Adjoining the main laboratory is a dark room especially arranged for scientific photography.

Beyond the main laboratory is a smaller apartment devoted to purely chemical work. In this the desks are equipped with water, gas, and electricity, while a fume-closet connected with a special flue in the chimney serves to carry off noxious gases.

Adjoining the chemical laboratory is a small room for the storage of chemicals.

Owing to its situation upon the side of a hill, a well lighted basement is secured. Here is installed a one kilowatt motor generator furnishing direct current for experimental purposes, and for charging the laboratory storage-battery. The basement also contains a work bench well stocked with tools, the nucleus of a future shop, and ample shelves for the storage of laboratory glass-ware.

The building is heated throughout by hot water, and is lighted by electricity.

The Hillside Laboratory was planned primarily for physico chemical research along lines already developed by its owner.

At the present time certain interesting phenomena connected with the metals are under investigation. In the course of a series of experimental studies conducted by Dr. Getman several years ago at Bryn Mawr College, certain peculiarities were noted in the electrical behavior of metallic cadmium when it is immersed in an aqueous solution of one of its own salts. During the past year this phenomenon has been studied much more thoroughly, and several exceedingly interesting facts have been clearly established.

When a stick of cadmium is immersed in an aqueous solution of cadmium iodide, a difference of potential between the metal and the solution is developed.

Lest the term *difference of potential* be unfamiliar to some of the readers of this magazine it may not be amiss to attempt to make its meaning clearer. If two tanks of water, A and B, be connected by a pipe, and the water flows from A to B, we infer that the hydrostatic pressure at the point where the pipe leaves A is greater than it is where it enters B, and we attribute the flow to this difference of pressure. Similarly if two bodies, A and B, are connected by a conducting wire and an electric charge is found to pass from A to B

we say that the *potential* of A is higher than that of B, and the cause of the current is assigned to the *difference of potential* between the two bodies. Difference of potential may thus be thought of as a difference of electrical level. The unit in which difference of potential is measured is called the *volt*.

It was found that freshly cast sticks of cadmium were negative to the solution of cadmium iodide in which they were immersed, but the magnitude of this difference was not constant under apparently identical conditions. Upon prolonged immersion in the solution of cadmium iodide, however, a constant difference of potential was established, the average difference between the initial and final values being about 0.0093 volt.

Various hypotheses were advanced to account for these facts, but the only one which has thus far survived the searching test of experiment, is that which assumes the existence of two or more forms of the metal cadmium. Such different forms of the same element are known as *allotropic modifications*,

Allotropic modifications of an element undergo transformation from one form into the other at a definite temperature

known as the *transition temperature*. Obviously at this particular temperature there should be no difference between the electrical behavior of freshly cast cadmium and that which has been immersed for some hours in a solution of cadmium iodide. This was actually found to be the case at about 70°C . Therefore, this temperature may be considered as a close approximation to the transition temperature of the two forms of cadmium.

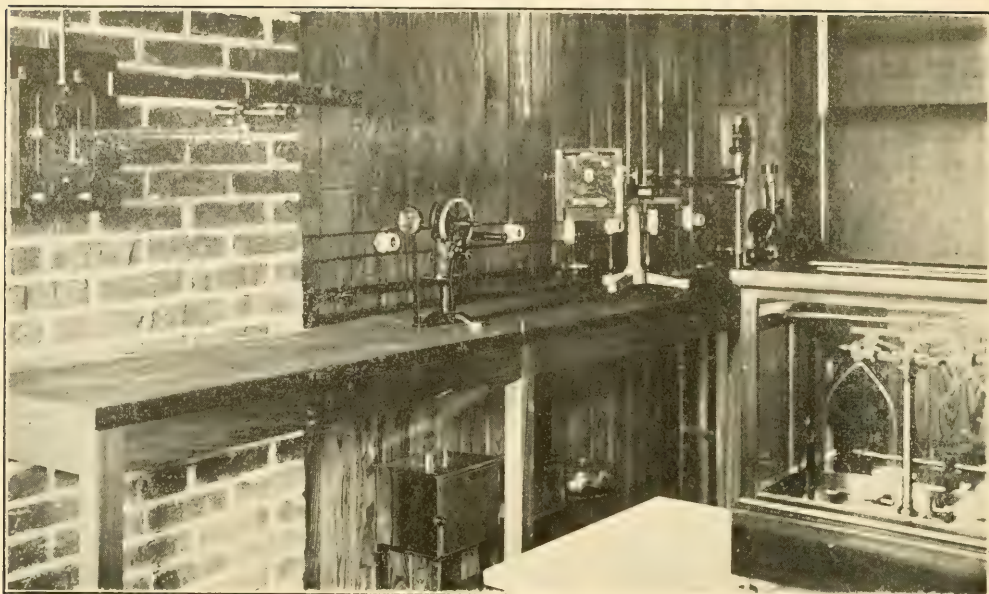
Furthermore, if we were to construct a cell having for its two poles sticks of freshly cast cadmium, and cadmium which had been transformed by prolonged immersion in a solution of cadmium iodide, and having as an electrolyte a solution of a cadmium salt, the direction of the current furnished by such a cell should be conditioned by its temperature. Below 70°C the freshly cast electrode should be positive, while above 70° it should be negative.

A careful series of experiments served to completely verify the correctness of this prediction.

Among other facts it was observed that whereas freshly cast cadmium has a bright silvery lustre, that which has been immersed in a solution of a cadmium salt for twenty-four hours acquires a dull gray color.



THE OFFICE OF THE HILLSIDE LABORATORY.



A CORNER IN THE MAIN LABORATORY.

It therefore seemed of interest to subject the surface of the metal before and after immersion to microscopical examination.

The results of such observation were more than gratifying as the accom-

panying photomicrographs will show.

The appearance of a piece of freshly cast cadmium, polished and etched in nitric acid, is shown in Fig. 1, the magnification being two hundred diameters. After five weeks immersion in a solu-



MAIN LABORATORY SHOWING VIBRATION-FREE SUPPORTS.



FIG. 1. SURFACE OF FRESHLY CAST CADMIUM.

tion of cadmium iodide, the metal appeared, under a magnification of one hundred diameters, as shown in Fig. 2.

That we are, in fact, dealing with allotropic modifications of cadmium can no longer be doubted. Furthermore the change in crystalline form is from a lower to a higher degree of symmetry, which is as it should be, if the freshly cast metal is to be more electropositive than the gray modification.

Other lines of evidence are being accumulated to confirm the correctness of the view that cadmium exists in at least two allotropic modifications.

It is of interest to point out that similar results have recently been obtained by Professor Ernst Cohen of Utrecht, Holland.

He has succeeded in showing that ordinary freshly cast cadmium consists of a mixture of three allotropic modifications which he designates as *a*, *b*, and *c* cadmium.

In addition to the investigation of cadmium, similar studies are being carried out with lead. While it would be premature to make any detailed statement at this time yet it may be of interest to point out that there is unquestionable evidence in favor of the allotropism of lead. This is clearly shown by Figs. 3 and 4. In Fig. 3 is shown a photomicrograph of a freshly cast lead surface magnified one hundred diameters, while in Fig. 4 the same surface is shown after six weeks immersion in a solution of lead acetate.

the magnification being one hundred diameters.

The complete disintegration of the metal is clearly shown in Fig. 4.

The question that the visitor to the Hillside Laboratory invariably asks is, "What is the practical bearing of all this work"?

To this Dr. Getman invariably replies that he does not know,—that it frequently happens that discoveries, which at the time when they are made are of purely scientific interest, turn out later to have practical application and hence commercial value.

In writing to the Faraday Society of London about his work along similar lines, Professor Cohen has this to say: "*****A new field of research for chemists, as well as for physicists, presents itself. Whilst it will be the task of the chemist to prepare the pure modifications (of the metals) and study their physicochemical properties, the physicist will require to turn his attention to the determination of their physical and mechanical constants. As the phenomena described have been unknown up to the present, metallurgists have not been able to take them into account when studying the hardening of metals. And yet these reversible transformations, which so often go on so very slowly in consequence of the retardations mentioned above, must play an important role when the metals are subjected to changes of temperature.

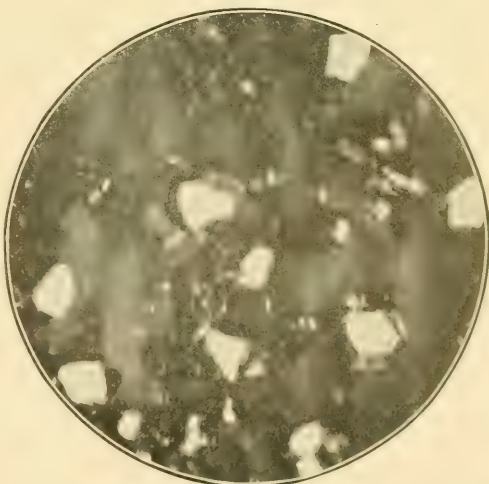


FIG. 2. SURFACE OF CADMIUM AFTER IMMERSION IN A SOLUTION OF CADMIUM IODIDE.

This role may become fatal if the metals are in contact with electrolytes (water), as these accelerate enormously the transformation velocity. The volume changes which generally accompany these transformations may cause the disintegration of the materials.

Research in pure science has its place in the world's work. It is not a mere pastime for the dilettante, nor is it an easy pursuit for the trained investigator. At the bottom of all of our real progress lies what may be called the scientific spirit.

*"Those who have come to understand what is meant by **scientific proof** of an hypothesis have learned that even the most fascinating theory may go down into oblivion if it cannot meet new facts."

"Scientific training tends to exalt the idea of knowledge attained.

Few people outside of the scientific circle can grasp the satisfaction felt by an investigator, when he feels that his work has opened up a new line of thought. The ordinary man, looking at the progress of chemistry, would be apt to imagine that the synthesis of a new dye, the production of a new explosive or the simplifying of some metallurgical operation would cause a profound impression in the scientific world. But such things can be produced by methods which are largely

sive, is a sudden development, which the ordinary man probably never hears mentioned, something which the scien-

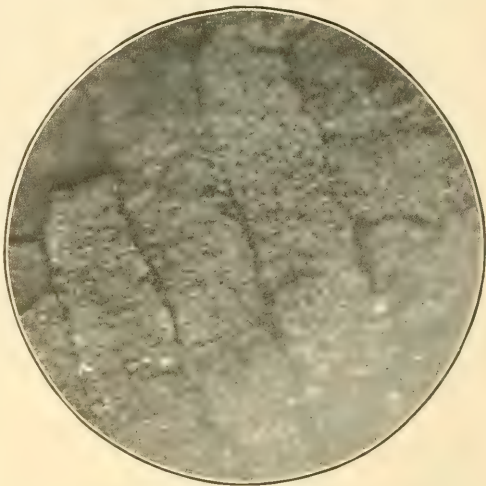


FIG. 4. SURFACE OF LEAD AFTER IMMERSION IN A SOLUTION LEAD ACETATE.

tific mind sees will revolutionize more than one field of inquiry, and bring a flood of light to bear upon intricate problems still awaiting solution. Applied science any one can understand, as it comes into touch with his daily experience; but applied science is only a superstructure built upon the solid foundations which have been laid by men who never sought to make a cash transaction of their knowledge. Yet, if it had not been for their labor, divorced apparently from all practical application, applied science would not stand where it stands today. On the one hand are the needs of humanity, on the other lies the search for knowledge; the bridge between them is applied science. But unless the pursuit of knowledge was going on, there would be no bridge, for the acquirement of knowledge must come before its application."

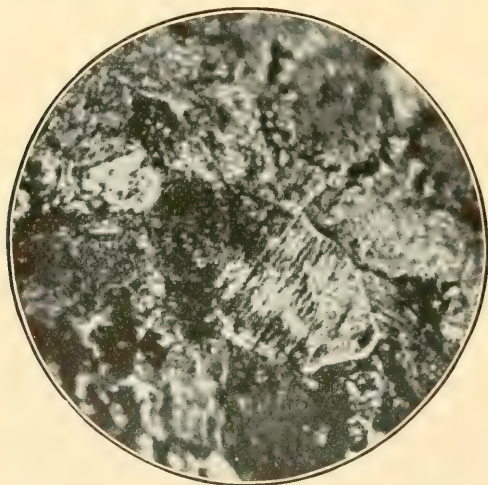


FIG. 3. SURFACE OF FRESHLY CAST LEAD. applications of old principles of no great scientific interest. What is much more rare, and therefore more impres-

*Chemistry and its Borderland. A. W. Stewart.

A new study of one of the Trypanosomes of the common rat, made by two British zoologists, adds an important point to our knowledge of human infections by way of rat fleas, such for example as the bubonic plague. The flea takes the infection from the rat by biting. But the rat becomes infected only by licking its own fur or by eating infected insects, not by the flea's bite.

A Beautiful Flower Bed in an Unusual Situation.

We have all heard that it is difficult to grow grass on a rock, but a lady of Sound Beach and her son have proved that it is possible to grow petunias on a rock.

The accompanying photograph shows a novel flower bed at the home of Mrs. Mary E. Campbell and her son, Mr. Mr. George W. Campbell, of Sound

a rim of pointed stones along the edge of that hollow that was then filled with earth. The result is that with constant care, probably with more care than an ordinary flower bed would need, Mr. Campbell has one of the most luxuriant beds of flowers ever seen in this vicinity. "Indeed," he says, "it was so sturdy a growth that we got tired of the rankness, and recently cleaned it out, and put in rosebushes." A good suggestion for ornamenting an other-



THE FLOWER BED ON TOP OF A ROCK.

Beach. Mr. Campbell is an architect of long experience, which he has applied in building a home for himself, comfortable and unique. The wall fronting the street is made of pointed rocks; the posts are capped in a similar manner. Within these caps earth has been placed, and in them flowers are growing.

But perhaps the most novel of these designs is the bold plan of growing petunias upon the top of the ledge. Mr. Campbell explains that the ledge was naturally somewhat hollowed at the top, and all he needed to do was to run

wise barren place to make it a thing of beauty.

The red rust of wheat has been virtually extirpated from Germany by destroying all wild barberry bushes near the wheat fields. The barberry serves as the host plant for one of the alternating generations, the other of which spoils the wheat. This being eliminated, the rust can no longer reproduce itself. In the same way, pear rust can be prevented by removing all juniper trees.

The Land of Paradoxes.

BY MR. JOHN C. UHRLAUB, RIDGEWOOD,
GLENBROOK, CONNECTICUT.

I believe the Chinese, rich and poor alike, of all people on earth, may be counted among the greatest lovers of

find there hundreds of citizens, resting after the toil of the day, sipping hot tea or wiping their face with one of the luxuries of a Chinese restaurant or theatre, the sweat cloth, a piece of cotton wrung out in boiling water, while at least half of the tea drinkers hold in their hand or

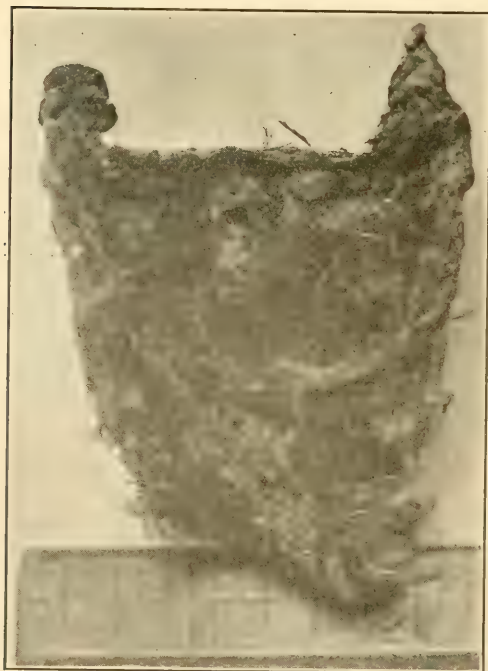


MR. UHRLAUB WITH THE PET BIRDS IN CHINA.

nature. To have evidence of this, one only need to go to any large tea house in Canton or in any other Chinese city, to

have on the table in front of them a cage containing a pet bird. I have seen a street beggar asking for alms with a caged bird on his arm. At dawn of a summer morning, I have seen hundreds of people sitting at the street corners or in the public squares and giving their pets an airing. Many of the birds are trained to do marvelous tricks. A rice bird of large size is commonly taught to catch a grain of "kalian" (giant millet) in the air and fly back to the hands of its owner and eat the grain at leisure while it sits on its patron's thumb. The birds, among which are many beautiful songsters, are petted and well cared for, and often have free access to their cage, going and coming as they please.

But the same John Chinaman that will assiduously and gently care for his song bird, will quietly look on the torture and execution of a criminal so horrible in its details that it would freeze our blood. A land of paradoxes and things incongruous, this flowery kingdom! In Peking on the old Hattaman Street, what a mixture of modernism and a remote past! A caravan of Mongolian dromedaries coming for eighteen hundred miles from the Gobi desert, laden with furs, wool and tea, meets a procession of Ford motor cars!



A BIRD'S NEST FROM WHICH THE CHINESE
MAKE SOUP.

But everything changes, even in China. Many Chinamen to-day prefer a juicy beefsteak to the finest plate of bird nest soup. I do not blame them, after having



A REMARKABLE "HEAD ON" PHOTOGRAPHIC STUDY.

both seen an uncooked bird nest and tasted the soup. The famous edible bird nest is formed of the regurgitations and excrements of a rock swallow, and is considered one of the greatest of Chinese delicacies. The soup tastes like musty dishwater. The Chinese are omnivorous in the fullest sense; aquatic beetles, owls, cats, dogs, rats, snakes, toads mice, are all dainty dishes for a Chinese palate.

I have assisted at some great Chinese dinners, some of one hundred and fifty courses, beginning with bird nest soup, shark fins, sea cucumbers (*Holothurea*), seaweeds, eggs a hundred years old, roasted dog, dried rats, fried ice, boiled water beetles, etc., etc.—that is, I have been present, but taste, appearance and odor preventing me from really eating.

Fried ice? Yes, fried ice is absolute-

ly correct. Pieces of flavored ice are covered with batter and quickly dipped in boiling lard. The batter, fried crisp, encloses a piece of ice. The dish is served with lightning-like rapidity from the frying pan to table.

Seeing Things in Autumn.

BY MAY L. JOHNSON, RICHMOND HILL,
NEW YORK.

Every lover of nature can find interesting things in the springtime, for then all the outdoor world is waking up and rising into life with a promise of glorious beauty to come; the birds are returning; we ourselves feel a new zest in living, it seems to be in the air. But how about the autumn? Each season has its attractions for the true nature lover, although some of our pessimistic friends who are poetically inclined may quote Bryant's:

"The melancholy days are come, the saddest of the year,
Of wailing winds and naked woods, and meadows brown and sear."

An yet even the withered leaves may be a source of enjoyment, as I discovered a short time ago, as I sat in the dusk and watched the wind playing pranks with the dead leaves that in the twilight looked like little brown mice. One moment they were whirling in a circle as though playing some childish game, then the wind changed and away they flew one after the other around the corner of the house, playing a game of follow the leader. A few moments later the wind veered and caught them from every direction and huddled them in a group. One could almost imagine that they were alive, and bobbing their heads together like a little company of fairies congregated like small boys to talk over some all-important secret, or planning what mischief to do next as they danced and fluttered; but the restless wind scattered them even before their plans could be laid and away the little brown fellows flew, each to his own important task. To a person of the average amount of imagination it seemed hard to believe that they were inanimate. If our friends would enjoy this moving picture experience in the twilight of a windy autumn evening before the leaves are gone, I am sure they would appreciate literally "The Fun of Seeing Things."

Collecting Crooked Sticks.

BY FRANK A. ARNOLD, NEW YORK CITY.

[Reprinted by permission from the August Countryside Magazine].

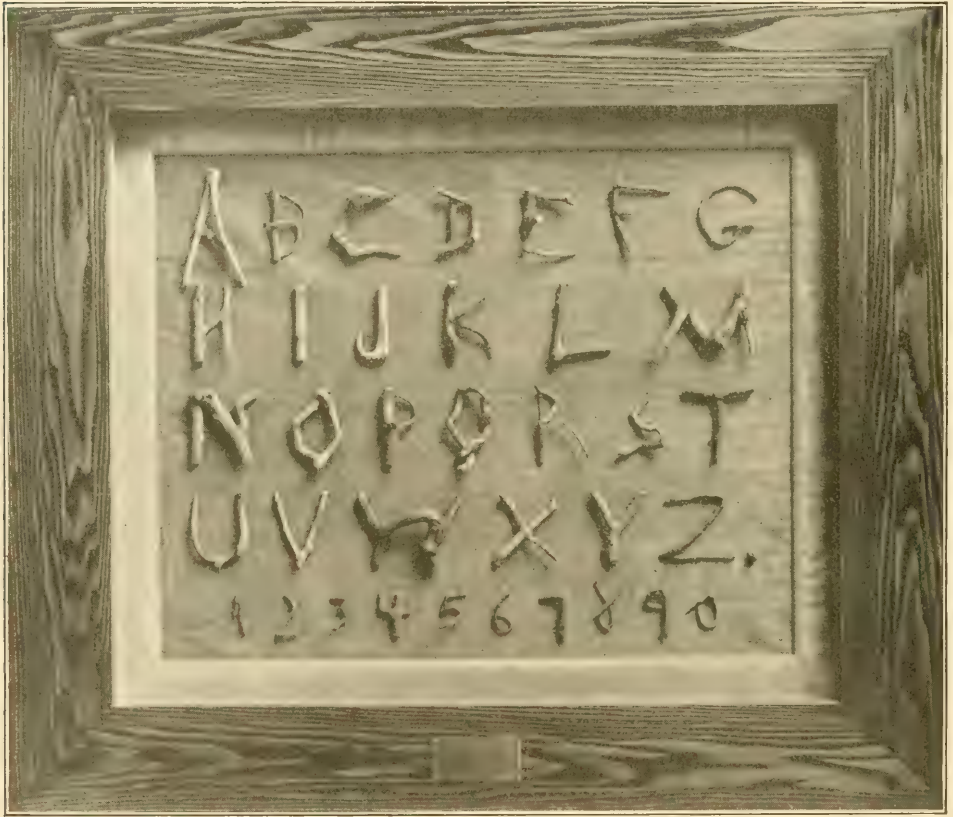
It is said that every man has, or should have, a fad. Among the faddists are many collectors, but who ever heard of a man collecting crooked sticks? There is such a man, however, —E. A. Miles, of Clifton Springs, N. Y.,

wan, Canada, and was cut from a small tree, close to the wood's path, leading to the Canadian Pacific Hotel.

"C" was found about 300 feet below the summit of Mount Tamalpais, California, within sight of the city of San Francisco.

The letter "D" came from Erie County, N. Y.

"E" was found in the village of Marilla, near Buffalo, N. Y.



THE ALPHABET FROM MOTHER NATURE.

—who has collected all the letters of the alphabet from Mother Nature in the shape of crooked branches of trees and shrubs, and with just one root to finish the twenty-six letters.

Here you have the collection before you, framed and photographed, and worthy of permanent preservation in narrative form. Mr. Miles has been collecting these letters for many years, and each letter has its history.

"A" comes from Oshawa, Canada, on the northern shore of Lake Ontario, about forty miles east of Toronto.

"B" was found at Banff, Saskatche-

"F" in a grove at the Great Falls of the Potomac, about thirty miles from Washington, D. C.

The letters, "G," "K," "M," and "W" were found either in, or near Attica, N. Y. How very appropriate that when he found the letter "M" he should have been taking a walk through the woods with his mother!

It is quite natural that several of these specimens should have been found near Mr. Miles's home, in Clifton Springs, N. Y., for he is a great walker, and enjoys exceedingly a long ramble through the fields and woods, where,

with his eyes wide open, he sees many things which the ordinary pedestrian would overlook entirely.

The letter "N" which was the first of the series, was discovered in this vicinity; likewise the letters "H," "O," "P," "S," "U," and "Z."

The letter "H" formed a portion of a root, and is the only exception in the list, the other letters coming exclusively from branches of trees.

The letter "I" grew in a small park adjoining the home of the late William A. Wheeler Malone, N. Y., once Vice-President of the United States.

"J" was cut from a scrubby tree about fifty feet from the edge of the Grand Cañon of the Colorado, in Arizona.

"L" came from Lundy's Lane battlefield, Province of Ontario, Canada.

The letter "Q" was found growing beside the trail leading to, and about five hundred feet from the summit of Mount Lowe, Southern California.

"R" was discovered at the corner of Queen Park Avenue, Toronto, not far from the Parliament Buildings.

The letter "T" has an exceptional history. Mr. Miles was visiting the tomb of Abraham Lincoln, at Springfield, Illinois, and, by a strange coincidence found a workman pruning a tree directly beside it. With his quick eye, Mr. Miles detected a branch which would naturally form the letter T, and in a moment it was his, with all of its historical association and without a hint of vandalism to his charge.

"V" came from the "Plains of Abraham, Quebec, where "Wolfe died victorious."

"X" was found very near the Fifth Corps headquarters Monument on Little Round Top, Gettysburg, Pa.

The letter "Y" has another bit of interesting history. It was found forming a part of a bush, growing where the Union Army commenced the tunnel, which, when completed, terminated in a chamber under Fort Malone in front of Petersburg, Virginia. When the mine was exploded, it created what is known in history as "the crater."

It will be noticed that, in addition to the letters, a complete set of numerals has been obtained in the same way; all of these, however, having been cut from trees or bushes in the immediate vicinity of Clifton Springs.

In talking of this unique collection,

Mr. Miles says that in no instance has any twig or branch been bent or artificially twisted. Each letter and numeral represents the actual formation by Nature—a fact which renders this alphabet all the more wonderful.

We read often of how the preacher obtains sermons from stones, books from running brooks, and so on; but, so far as we know, it has been left for Mr. Miles to obtain from Nature the sum total of human knowledge, as embodied in the alphabet and its corresponding word combinations!

If you should by chance be in Clifton Springs some time, stop your automobile in front of the Sanitarium, and step just inside the lobby, and there, protected by a frame, you will find the original from which the above illustration was taken, and, if Mr. Miles happens to be at his desk, I know how pleased he will be to tell you some of his personal experiences connected with collecting these bits of wood.

T. A. Jagger, formerly of Harvard, now of the Hawaiian Volcanic Observatory, with a number of his assistants, narrowly escaped losing their lives during the recent eruption of Mauna Loa. The party had ascended the mountain for nearer observation of the crater, and were caught by a storm and avalanches almost in the path of a lava stream.

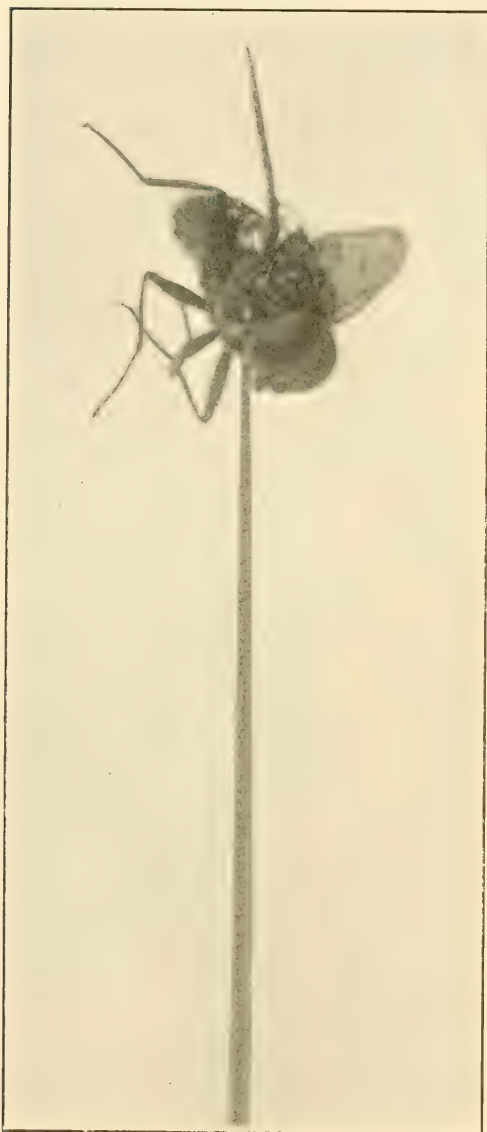
"Perhaps the most convincing sign of this new-old faith is the unconsciousness of the unbeliever. He has no idea that he is believing or having faith in any thing. He is simply loving the green earth and the blue sea, and the ways of birds and fish and animals; but he is so happy in his innocent, ignorant joy that he seems almost to shine with his happiness. There is, literally, a light about him—that light which edges with brightness all sincere action. The trout, or the wild duck, or the sea bass is only an innocent excuse to be alone with the Infinite. To be alone. To be afar. Men sail precarious craft in perilous waters for no reason they could tell of. They may think that trawling, or dredging, or whaling is the explanation: the real reason is the mystery we call the Sea.—Richard Le Gallienne in "The Phoenix."

An Impaled Fly.

New York City.

To the Editor:

A few days ago I was camping on that stretch of sand and sand dunes which ranges from Fire Island to Mon-



THE WIND IMPALED THIS FLY.

tauk Point, and separates the Atlantic Ocean from those inland bays, such as Great South Bay, Peconic Bay, etc., and was forced during this period to supply my own meals through my craftiness as a fisherman and hunter.

As I found no birds flying along the shore, I decided to enter the fields of sedge grass and try my luck there. I

lay down in grass about three and a half or four feet high, and scanned the horizon for any birds that might be coming my way. Every time I looked over my left shoulder I saw, a few feet from me, a blade of sedge grass on which a fly seemed to be perching. After a lapse of from fifteen to twenty minutes, I became curious to learn how and why that fly clung to that blade of grass, so I laid down my gun and walked over to gratify my curiosity, and found that the sharp point of the grass blade had pierced the fly's body and was holding it impaled. It had evidently been flying over the field when a sudden gust of wind blew it against the tip of the blade and impaled it there. I brought it home, because I considered it a peculiar freak of nature, illustrating one of the many dangers that threaten the insect world.

I took the specimen to the Museum of Natural History and showed it to the curator, Doctor Lutz, who told me that he had never seen a similar specimen. The butcher bird kills insects of all kinds and places them on thorns but Doctor Lutz doubts if this bird is a habitant of this stretch of Long Island.

I enclose two photographs made from the specimen. I shall be pleased to hear what you think of them.

Very sincerely yours,

A. L. GOODMAN, M. D.

This is a rare and remarkable accident. The fly's life was lost as is that of a tree when it is blown over by the wind.

The Missouri Experiment Station reports encouraging progress with its efforts to breed more hardy strains of several of our most prized varieties of peach.

I think your August number quite excellent and the September number its equal. I hail with delight the new department of "Ornithology." In fact if I were to try to express my appreciation it would take shape something like the following: THE GUIDE TO NATURE is a live olive leaf dropped into my window by the dove of good fortune that impels the belief that the blinding mists are abating and a new beauty is rising from the common like a green island thrust up from the sea!—Will Webb Tuttle, Muncie, Indiana.

Animal Art Stamps.

The increasing popularity of poster stamps and their collecting in various ways has suggested the reproduction in that form of some of the remarkable photographs of animals taken in the New York Zoological Park during the fifteen years that institution has been open to the public.

The series issued at this time con-



A SAMPLE OF ONE OF THE STAMPS.

sists of 130 subjects, reproduced in natural colors by the four-color process. The stamps are $2\frac{1}{8}$ x 3 inches in size and are particularly clear and well executed pictures. They are to be disposed of in six sets of twenty stamps each, at ten cents per set. The remaining ten stamps of the series are mounted in a thirty-two page album sold at fifteen cents, which provides space for the entire 130 stamps, making the cost of the complete series and album seventy-five cents. Carefully written captions giving authentic information regarding each animal represented appears in the album under the space for each stamp. This educational feature, in connection with the fact that they are from actual photographs, which include many rare animals unknown to the average child, makes the series the most worth while picture stamps that have yet come to our attention.

If this issue proves popular, others will follow, as the collection of photographs available runs into the thousands.

Tests at the Maryland Agricultural College show that 700 yards is the outside limit to which a fly commonly roves from the point where it is hatched.

A Mouse-eating Garter Snake.

BY JOSEPH W. LIPPINCOTT.

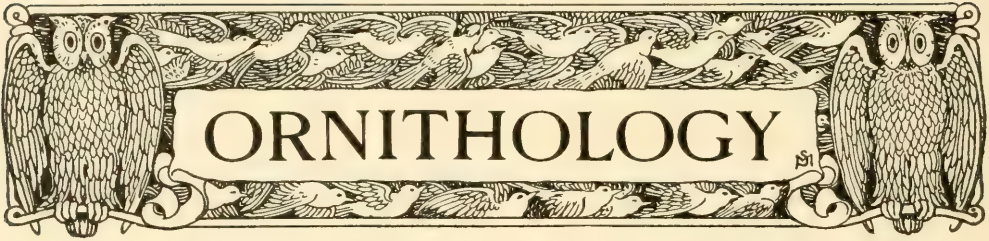
It is claimed by anthropologists that different species of snakes have a restricted diet from which they never vary and that those which eat batrachians will never eat warm-blooded animals and vice versa; nevertheless I once saw a garter snake swallowing a meadow mouse regardless of the fact that this species of snake comes under the former head and feeds regularly on toads, frogs, small fish and earthworms.

It happened that, when walking along the sea cliffs on Conanicut Island, Narragansett Bay, I saw quite a distance away a queer head rear itself above the thick meadow grass, wag oddly once or twice on its thin neck and then drop again below the grass tops. It proved to be a stout three-foot garter snake with the biggest, fattest, short-tailed meadow mouse I ever saw stuck in his jaws in such a way that it seemed a prolongation of the snake's head. The hind quarters and the tail were down the throat and when the snake reared up in his earnest yet comical endeavors to climb over the grass in the direction of a briar patch, the mouse seemed to be calmly sitting on a pedestal.

The grass was too thick to push through with the cumbersome load so the snake rose on his tail as high as he could and then toppled over, or rather flung himself, towards his goal. His head would land in the grass about a foot away from where the tail had been, the tail being drawn after the head and coiled again preparatory to repeating the strange performance.

I evidently hastened the reptile in his retreat for he soon made much quicker motions and scarcely ever rested between jumps. The closer I watched the more nervous he grew until without any warning he disgorged the half swallowed mouse and then beat a very hasty retreat to the briar patch, finding no difficulty in threading his way through the grass now that the bulky prey was discarded. There was not the least doubt about his being a common garter snake.

New measurement by a French astronomer shows that the sun's corona is apparently spinning faster than the general mass. About two miles a second is the probable velocity.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

What One Bird Club Is Doing.

When any organization reaches a membership of over half a million it naturally commands some attention.

The Liberty Bell Bird Club—without doubt the largest organization of this kind in the world—has reached these proportions, and in two and a half years' time.

The active work and growth of this club is outlined below by Mr. Shoffner, its leader, at my request, and the magnificent results accomplished in so short a time should be a source of gratitude to all friends of the birds and an inspiration to other clubs of a like nature.

Over Half a Million Bird Club.

BY CHAS. P. SHOFFNER, PHILADELPHIA,
EDITOR OF THE LIBERTY BELL BIRD CLUB.

In this day and generation, any movement to be a success, must be built on a need. You can popularize, to a certain extent, almost anybody or anything by advertising and a judicious use of printer's ink. But to make a movement grow, increase in value and in the estimation of the, very often, fickle public, is another problem. If the foundation is of sand, down your building will go, it matters not how fine, strong, or well planned the superstructure.

When the formation of a new bird club was discussed two and a half years ago, there were fifty-seven apparent reasons given why such a club was unnecessary. There were many bird clubs, there had been bird clubs for years, folks wouldn't join any more clubs, and so on and so on.

We know now they were not reasons.



A LIBERTY BELL BIRD CLUB AT BAKERVILLE, MASSACHUSETTS.

The one who believed in the new club idea was positive of two facts, first, that we should have more birds, and, second, that the great majority of the bird clubs confined their activities principally to the cities.

So, on January 1, 1913, The Liberty Bell Bird Club was formed. The name was significant: Independence for Birds. The motto was, "Protect our Feathered Friends." The Pledge: "I desire to become a member of The Liberty Bell Bird Club, and promise to study and protect all song and insectivorous birds, and do what I can for the Club." The "Farm Journal," of Philadelphia, was to be the official spokesman, and the publishers of that paper said, as an educational feature and with a sincere desire to help the farmers of America, they would bear the expense of the Club. There were to be no dues, no fines, no assessments of any kind. Upon receipt of the signed pledge, a button and a twenty page "Guide" were to be sent free of all charge.

The great feature of the Club was that it was especially formed to interest, instruct and enlist the support of the men, women and children of the country, the real place where birds are found. Of course, city members would be welcomed. We now have many thousands in the cities, and we would like to have more.

The Club grew rapidly. On its first birthday, it had 86,000 members, on its second birthday, 252,904 members, and to-day August 4, 1915, 533,194 members. We believe it to be the largest *active* bird club in the world. Our members work. We started a campaign of education and it has brought forth much good fruit. Formerly few farmers had bird-houses or nesting thickets. To-day, thousands of farms have both and thousands of trees have been planted to furnish food for the birds.

Our birds have been thoughtlessly slaughtered for food and for adornment. Civilization and the onward tread of the times have taken from the birds their natural food supply. They decreased, but the insects, which only the birds can keep in check, increased. Those insects cause an annual loss of \$1,000,000.00. The farmers are the sufferers.

Increase the bird population and the insect pests will decrease. The Liberty Bell Bird Club members are pledged to increase the bird population, and they are doing it.

Up to March 1, 1915, we brought the battle for the birds before 3577 county superintendents, 166,471 school teachers, and introduced bird study into nearly 9,000 schools.

Our members have put up thousands of bird houses, faithfully fed the birds in winter and given them water in summer. We have installed many bird sanctuaries and have established the second Friday in April of every year to be the Annual Bird Day of The Liberty Bell Bird Club. This year, celebrations were held from Maine to California and from Canada to the Gulf. We believe our Club was the first to buy an entire page in one of the great magazines to bring the subject of bird conservation to the attention of the country.

Our Platform is easily understood. Here it is:

Protection by competent laws throughout the world for all song and insectivorous birds.

The teaching of practical ornithology in all public and private schools.

The regulation, but not persecution, of cats, red squirrels, and all enemies of the beneficial birds.

The establishment of bird sanctuaries in every city, town, village and hamlet.

The planting of trees, shrubs and vines that will attract and feed our birds.

The putting up of safe and artistic bird houses and the feeding of our winter birds.

We have not always received roses. Many could not believe we were sincere, so we have had to print this: "Save the Birds, The Farm Journal can take care of itself." Educators, ornithologists and economic students everywhere have approved our work, and we are much encouraged.

Now, dear friends, don't you think our Club was needed?

Much more remains to be done. The more we can interest, the sooner will bird protection become an assured fact. Remember this, The Liberty Bell Bird Club is trying to secure the right balance of bird life, in a practical way.

Are you with us?

First Federal Bird Preserve in Minnesota.

By executive order of the president a small rocky islet on Mille Lacs, Minnesota, which is the breeding resort of a number of varieties of gulls, has been set apart for a federal bird reservation.

The Poisoning of Birds by Spraying Trees.

The increasing use of arsenate of lead in spraying orchards and shade trees for the suppression of insect pests seems to have created considerable alarm among

arsenic is required to kill caterpillars, and a great many of the poisoned ones would have to be eaten at one time to affect a bird under ordinary conditions.

In ten years' experience with spraying in various localities the writer has been



A BIRDLESS AREA STRIPPED BY GIPSY MOTHS.

Photographed in July.

bird-lovers generally as to the danger of killing birds through the poisoning of their food. Especially has this been the case throughout the territory of the gypsy and brown-tail moth infestation in Massachusetts and elsewhere, as it has frequently become necessary to spray large areas of woodland, and there has been a number of reports of birds being found dead in these localities, attributed to the spraying.

A thorough investigation of this matter tends to show, however, that there is little danger to birds of poisoning from this source, and there appears to be several practical reasons born out by extended and careful observation for this conclusion. That birds will seldom feed upon dead or dying caterpillars has been practically proven in many instances, and by this means only would they be likely to obtain much of the poison. Very little

interested to note its effect on birds, and has never known of an instance of a bird being killed by the poison, nor of their deserting the locality on account of this work. He has, however, seen birds' nests deserted and found young birds dead and dying from heat and exposure in infested areas where no spraying had been done and the trees and shrubbery were eaten bare by the caterpillars. Such an area is destitute of bird life, and under present conditions any badly infested locality is sure to be reduced to this condition if it is not sprayed.

Dr. Willard G. Van Nann, Zoologist of the New York State Museum, writes me as follows in regard to this subject:

"In regard to the poisoning of birds by spraying trees there seems to be a general agreement that it is responsible for killing some birds, especially orioles, cuckoos, grosbeaks and purple finches,

but when positive evidence is sought it is surprisingly hard to find. Several purple finches have been sent in to this office which appear to have been killed in that way but the evidence is not positive. The State Entomologist, Dr. E. P. Felt, was unable to give me positive instances when I inquired of him recently and he probably would have informed me if he had learned of any since then."

The following extracts are also of interest, bearing directly upon the subject at hand:

From Prof. E. H. Forbush, State Ornithologist of Mass. Report of 1912:

"Reports of the finding of dead birds under trees sprayed with insecticides continue to come in but no great numbers of birds have been found in any case, and two years' work investigating the subject leads to the belief that very few birds are killed by spraying."

The following from the Bureau of Biological Survey at Washington, D. C.:

"In response to your letter about arsenical sprays for birds, I may say that there is little evidence that birds are killed as the result of such work. The problem has been investigated by the State Ornithologist of Massachusetts, by this Bureau, and by the Bureau of Entomol-

ogy with the result that little tangible connection could be established by the use of sprays and other insecticides and the death of any wild birds.

Very truly yours,

E. W. NELSON,

Acting Chief, Biological Survey."

In conclusion, this extract from Prof. H. A. Surface, D. Sc., State Zoologist of Pennsylvania, who is an exceedingly careful and painstaking investigator, seems to bear out the above testimony and should be convincing:

"Replying to your letter of the 21st, making inquiry concerning the poisoning of birds by spraying, I can say that I have watched this subject with the greatest care in thousands of sprayed orchards in this state, and I am prepared to say with certainty that I have never known a case of a bird being killed by spraying, or having been found dead under circumstances that would justify the suspicion that this was the cause of its death. We have examined the stomachs of dead birds, and have found no evidence of arsenic to which their death could be attributed. I live in the midst of one of the largest orchards in Pennsylvania, which has been sprayed frequently, and it is full of birds' nests. I am sure that if spray-



A SPRAYED TERRITORY AND PLENTY OF BIRDS.

ing were destructive to birds they would not be nesting in this orchard.

"It is true that there is a firm engaged in the manufacture of a so-called insecticide, fungicide and fertilizer, which they claim contains "mineral oxides," but not poisons, and which they further claim should be used in order to prevent the death of the birds by the arsenicals. It can be seen that their statements of the poisoning of birds are a part of the methods of selling their goods. One of their agents has gone so far as to criticise me very severely, stating that I am responsible for the killing of birds in this State in great numbers, because I recommend arsenical spraying. It is true that I have made such recommendations, and have shown thousands of persons how to spray, and as a result of such instructions we have better fruit in this State than ever before; but the advocates of the bird-poisoning theory can not show evidence of a bird being killed by poison spray, and they can not reconcile the presence of birds in great numbers in sprayed orchards with their theory of death by sprays."

When the Birds Go South.

Even as early as the latter part of June, when the red-wings are flocking, after their nesting season, we have occasional reminders of that miracle of bird life to begin—the fall migration. It seems hard to comprehend the powerful instinct which calls these tiny bits of life twice

annually on their long journey—a journey filled with dangers and fatalities—and which guides them across the thousands of miles of that trackless and seemingly unknown territory of the air.

Now and then, as I write, the faint chirps of passing flocks high up in the darkness come drifting down to me, though I cannot identify their voices, for these night calls of the migrants seem different from any we hear in our ordinary acquaintance with the birds at home. I have sometimes listened by the hour to these chirps and twitterings. A few are recognizable at times,—the bobolinks, tanagers and some of the shore-birds giving calls which we know, but the vast army moves on, flying high or low, according to the weather conditions,—sometimes hundreds of miles without a pause,—and we are scarcely aware of their movements until we realize that they have gone.

Thus it is with the night migrants, though the several species which travel by day offer better chances for observation. The "honking" of the Canada geese announces their coming far in advance and we look up to see their wedge-shape flocks cleaving the sky. Hawks and crows; swifts, swallows and many of the sea birds may be observed migrating by day, although many undoubtedly also pass over in the night.

The large flocks of grackles passing through the fields and pastures are conspicuous examples of this great move-



THE LARGE FLOCKS OF GRACKLES ARE CONSPICUOUS EXAMPLES.



DUCKS MIGRATING.

ment. . Flocks of robins, sparrows and finches may also be encountered along the hedges and roadsides as they are gathering for the flight, and many of the warblers on their leisurely journey southward spend days with us "en route" to rest and feed. Especially noticeable in the north-eastern and some of the central states is this fall flight of blackpoll warblers. These birds breed northward to Alaska; the flocks concentrating as they move southward, and all pass through Florida, The Bahamas and West Indies to the northern part of South America, where they spend the winter five thousand miles from their summer home.

In August we see immense numbers of swallows flocking about the ponds and marshes as they prepare to leave the locality; then suddenly in a day they are gone, and we cannot find one by searching. Some ten years ago, in north-eastern Maine, I had the opportunity of witnessing for over two hours a continuous flight of swallows and martins, of which I identified several species among the low-flying migrants. Thousands upon thousands of these birds passed steadily by to the southward as we watched them from a veranda, and the flight had not ceased when we left, although it had somewhat diminished. This was in the latter part of August late one afternoon, and the following day we saw no signs of any of these birds.

The night migrants have sometimes been studied by the aid of powerful search lights, or by focussing a telescope on the face of the full moon, and watching the birds as they move across its illuminated path. Much of interest may also be learned by spending the night upon some hill-top in a favorable location, noting the sounds and times of passing of the different birds.

The definite routes of migration now known to be followed by most of our birds may be studied to advantage, although many yet remain a mystery and there is ample opportunity for research along these lines. Perhaps some day we will know what becomes of the chimney swifts as they disappear off the coast of the Gulf of Mexico after slowly gathering from their breeding haunts and migrating southward to this point. It is only known now that they absolutely vanish here in the fall, making their appearance again in the early spring from their unknown winter home.

Six species of our shore birds breeding north of the arctic circle and finding their way over an eight thousand mile route to Patagonia; the golden plover flying twenty-four hundred miles across the water, from Nova Scotia to South America, without food or rest, and the ering eleven thousand miles each way to arctic tern—champion of them all—covisit its winter home, are some of the

marvellous examples of bird migration.

Identifying the smaller birds—especially the warblers—during the fall flight is no easy matter: the predominance of immature birds in their differing plumages, and the change in many of the adults from their well-known summer garb to a totally different winter one, making them scarcely recognizable. The new songs of the young and changed calls of the old birds also seem to add to this difficulty. In northern Florida, in early November, I have observed this confusion among the warblers, sometimes studying them close at hand when there seemed to be so many different kinds that I could scarcely find two birds alike in the entire flock.

Bird migration is an interesting and important part of general bird study, and we should be glad to receive notes and observations upon this subject from any of our readers.

The Value of Birds to Man.

A few items from the comprehensive and valuable article under the above title by James Buckland of London, England, in the annual report of the Smithsonian Institution for 1913 have been briefly summed up in the following by the Alabama Bird Day Book, and printed in the August number of the "National Humane Review."

It is impossible to review the many valuable features of this article in so limited a space and it should be read entire by all interested in bird protection and insect depredations.

"Remarkable instances of the birds' services to man include the introduction of the English sparrow into New Zealand with the resulting elimination of the thistle and the caterpillar, which were ruining the land and crops, and the saving of Australian agriculture from the grasshoppers by the straw-necked ibis, in individual craws of which an average of 2,400 grasshoppers was found. The story of Frederick the Great, wherein he is alleged to have ordered all small birds killed because the sparrows had pecked at some of his cherries, and the resulting lack of fruit but fine crop of caterpillars two years later, proves a graphic lesson. The "Scalp Act" of Pennsylvania, which paid bounties of \$90,000 for the extermination of hawks and owls, lost for the State

\$3,850,000 in damage to agriculture, due to the increase of small rodents which resulted. When Montana was free from hawks and owls it became so overrun with destructive rodents that the Legislature offered rewards for them—a task which the banished hawks and owls had performed free of charge. But during the first six months such large sums of money were paid out that a special session of the Legislature was called to repeal the act before the State went bankrupt. In 1912 Lord Kitchener pointed out the necessity of prohibiting the destruction of certain Egyptian birds which prevented insect pests."

Shore Bird Protection.

The placing of the small sandpipers, curlew, avocet, godwit and several species of plover which have been nearing extinction on the protected list under the federal law is a timely procedure by our national legislators.

Mr. Wells W. Cooke of the Biological Survey in advocating the prohibiting of all shooting at the beach resorts along the Atlantic coast is also starting a movement which should do considerable toward increasing these graceful little birds which add so much to the life along our shores, and every property owner at these resorts should gladly give his assistance toward the securing of such legislation.

A fifty-three page article, with seventy-two colored plates and four half-tones, on "American Game Birds" appears in the "National Geographic Magazine" for August; this being the fifth of a comprehensive series of bird articles printed in that magazine within the past two years.

The present article deals with the waterfowl, shore-birds, grouse, quail, etc.,—each picture being accompanied by a short description of the bird's habits and range. The plates are from paintings by that well-known bird artist, Louis Agassiz Fuertes, and the text is by Henry W. Henshaw, Chief of the U. S. Biological Survey. This list is supplemented by a short resume of the protective game laws and an index, and, especially in connection with the previous articles referred to, which have been combined and issued in a thin volume, it makes a handy reference.

Feeding the Birds.

It is none too early in the northern and middle states to start putting out food for the winter birds, as the more they become accustomed to their feeding stations, the more surely have we won their confidence and the more plentiful they will be about our homes during the winter months.

Suet, scraps of meat and broken pieces



THIS FOOD BOX IS NEVER EMPTY.

of bone should be tied to the trees or attached by some of the wire feeding cages made for this purpose, and seeds, crumbs, and vegetable scraps may be placed in window boxes, where the birds may be closely studied at their feeding.

If wild seed-bearing shrubs and fruiting trees have been planted about the grounds many will now be maturing and are attractive to several species of our migrating birds. Some of these in favorable locations may winter over where there is an abundance of food, when otherwise they would leave for the want of it.

Water should be kept in the bird-bath until there is danger of freezing, as there will be many days when the birds will delight in its use.

The window-box shown in the picture is never without food; there are always scrap-bones hanging in the trees nearby, —and there is an abundance of birds of various kinds about this farm at all seasons of the year.

Birds in the War Zone.

From the firing line in Flanders, along with the boom of heavy artillery and the snapping of musketry, comes word by a correspondent of the "London Times" of the friendliness of many of the small birds and the interest taken in them by the entrenched soldiers.

The writer speaks of skylarks running about over the ground and sometimes in the heavy cannonading soaring aloft and singing as if their ambition were to drown the noise of the bombardment. Blackbirds, robins and others, seemingly indifferent to the intermittent firing, make friends with the men,—even hopping down into the trenches for food offered them,—in one instance a bird alighting on a bayonet held up out of the trench for it.

Many other stories of bird observations come from letters written home by the soldiers, showing instances of their appreciation of the songs, and facts relating to birds nesting on the battle-grounds that seem truly remarkable under the circumstances of their environment.

A Rooster that Puts Up at a Hotel.

While sitting in the office of a hotel at English, Indiana, my attention was attracted to a rooster that was wandering slowly along the sidewalk, having apparently come in from the suburbs. What was my surprise when I saw him walk to the door and peer through the wire screen. The proprietor advanced, opened the door for his approaching guest and, lifting him in his arms and proudly displaying him to the other guests in the office, explained that the rooster is a permanent guest with a room to himself and a nice big bed. When young, the bird had his thigh broken. The bone was set and bandaged, and during the healing process the rooster became very tame and was brought in every day to the bed. As his recovery progressed, he began to make daily journeys, gradually increasing the distance, but never associating with other fowls, for, while he was so nearly helpless, the others jumped on him, pulled out his feathers, and so annoyed him that he decided that the hotel is a good place, and every evening returns and suggests that he be taken to his room.—E. F. B.



TO KNOW THE STARRY HEAVENS

The Starry Heavens in October.

BY PROF. ERIC DOOLITTLE, OF THE UNIVERSITY OF PENNSYLVANIA.

During the past month the whole of the striking constellation of the Scorpion has sunk below the western horizon of the evening heavens; Sagittarius has partly disappeared, as has also the winding Serpent and the great Bootes, the principal star of the latter constel-

now swung completely below the Pole which has shone so brightly in the and is seen resting in an upright position almost upon the horizon; here it seems to be a far larger figure than when it is higher in the heavens. The Solitary Star, Fomalhaut, is almost on the meridian in the south, the Great Square of Pegasus is high in the heavens, and the planet Jupiter shines out



Fig. 1. The Constellations at 9 P. M., October 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

lation,—the great, reddish Arcturus,—northwest for so many months, has completely withdrawn, not to again be seen in our evening skies until next March.

In the North, the great Dipper has

with its steady, golden radiance in the Southwest.

The October Stars.

But the most interesting of all the changes in the heavens is the reappearance of the brilliant Taurus, the very first of the train of Winter groups,

which, with its beautiful Pleiades and Hyades, will now be seen well above the ground in the northeast. The little dipper-shaped group of rather faint stars which form the Pleiades is the

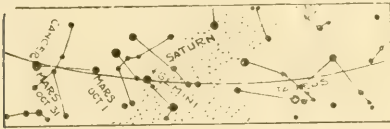


Fig. 2. Showing the present positions of the planets Mars and Saturn.

most noted of all star groups in the heavens. Every nation had its legends about this beautiful star figure, and many peoples regulated their calendar by its appearance and withdrawal from the evening sky. The little group can easily be seen and studied now, but it is November which is the Pleiad Month and which marked the beginning of the new year when this was determined by these stars.

The observer will probably at once notice six stars in the Pleiades, but a small telescope or opera glass will greatly increase the number, while on a delicate photographic plate no less than two thousand have appeared. All of these form a compact little group of stars, which are moving through space together, and it is most remarkable that the principal stars of the cluster are surrounded and connected together with clouds and streams of faintly shining nebulous matter.

Below the Pleiades there is the beautiful V-shaped group of the Hyades, whose principal star is the great red-dish Aldebaran, or Follower, so called because this star is seen to follow the Pleiades across the sky as the hours of the night go by. The light from this star requires twenty-eight years to reach us. If we represent the great distance which separates the earth from our sun by one inch, then the distance to Aldebaran, preserving the same scale, will be no less than twenty-seven miles.

* * * * *

The Planets in October.

Mercury which reached its greatest distance east of the sun on September 27, may possibly be detected low in the southwest after sunset during the first few days of October, but it will soon

be again lost in the sun's rays. On October 22 it will pass to the west of the sun and enter the morning sky. On October 30 the planet will be nearest the sun and this little world will then have its season of greatest heat. At this time more than twice as much light and heat will be poured down upon it as it will receive when it reaches its greatest distance from the sun forty-four days later.

Venus is in the evening sky, but too near the sun to be well observed. It sets about 20 minutes after sunset on October 1, and this time is increased to nearly an hour by the end of the month.

Mars and Saturn are conspicuous in the heavens during the late hours of the night but they are still beyond the borders of our evening map. The former is moving eastward so rapidly that it passes from Gemini entirely across the constellation Cancer during the month; Saturn is near the center of the former constellation, in the position shown in Figure 2. Jupiter is in excellent position for observation. The most interesting phenomena of its satellites will be seen on the evenings of October 9, 15, 22, and 31.

* * * * *

The Planet Uranus.

This great world, no less than 32,000 miles in diameter, is always so very far away from our earth that it is never more than barely visible to the naked eye, and even in a moderately large

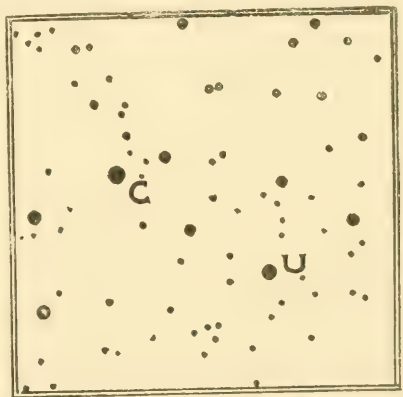


Fig. 3. The small square of Fig. 1 enlarged to show the position of the planet Uranus.

telescope it is always an inconspicuous object. Yet this planet, with its very strangely moving system of moons and the remarkable position of its axis is

one of the most interesting of all the worlds of our sun's family. During the present month it is not only in good position for observation but it happens to be so near a moderately bright star that it can be found with less difficulty than usual. And on October 16 the

glass, appearing as a greenish star of the sixth magnitude.

Though this distant world is so large it is far less dense than our earth and is indeed almost certainly in a vaporous condition. Long ages must pass before it can become a cold and solid world.

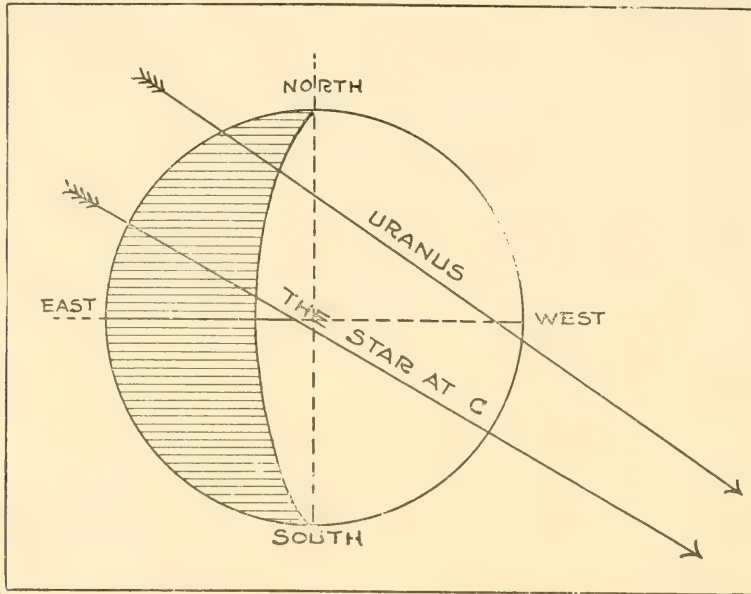


Fig. 4. Passage of Uranus and a star behind the moon on the evening of October 16.

planet will be occulted by the moon. On all of these accounts therefore, the possessor of a small telescope should not fail to search for this most interesting object.

Uranus moves steadily along the path A V B, Figure 1, completing the entire circuit of the heavens in eighty-four years. It is now in Capricornus, far below the celestial equator and therefore cannot rise very high in our southern skies, but for the past ten years it has been slowly climbing upward and in the course of thirty-two years more it will reach the Summer Solstice, near B, Fig. 1, and will then be in its highest position in the heavens.

The planet is now exactly 3 minutes 33 seconds west of the star at C, and 21 minutes 45 seconds south of it. In Fig. 3 all of the faint stars near C are shown. The faintest of these will probably not be visible in a telescope of but two or three inches aperture, unless the air at this low altitude is unusually clear, but Uranus will be visible in the smallest

It has a system of four beautiful moons whose paths among the stars are almost perpendicular to the path of the sun as seen from Uranus. It is very probable that the axis about which the planet turns thus lies in the plane of the orbit, a very strange position wholly unlike that of any of the other planets of our Solar System. Were the axis of our earth in a similar position the sun would be at some times nearly vertically above the north pole of the earth; six months later it would be vertically above the south pole, and not only the north pole, but nearly the whole northern hemisphere, would be in complete darkness.

Thus at some time during each year every part of the earth would be subjected to a tropical heat; at another time, six months later, it would be without sunlight,—or a frigid zone. The wind motions and the character of the seasons would thus be exceedingly intricate and unlike those we now enjoy.

The Occultation of Uranus.

The moon, which passes completely around the sky in one month, following nearby along the path A V B, Fig. 1, will pass over both Uranus and that star at C on the evening of October 16. As seen from Washington, the planet will disappear at the eastern (dark) edge of the moon at 9 hours 40 minutes P. M., Eastern Standard Time, and will reappear at 10 hours 43 minutes. The star will disappear at 11 hours 34 minutes and reappear at 12 hours 34 minutes, but at the emergence the moon will have set throughout the eastern states.

These exact times, however, apply only for observers at Washington, at another station they will be very different. The observer should therefore find Uranus in his telescope in the early evening and having noted the relative positions of the planet and the moon, he should estimate as closely as he can the time when the occultation will occur, remembering that the moon requires one hour of time to move eastward a distance equal to its own diameter. As the planet has a disc, he will see this object gradually fade away as the dark edge of the moon pauses over it; the disappearance of the star will, on the contrary, be absolutely instantaneous. This fact shows us that our satellite has no appreciable atmosphere upon its surface.

* * * * *

The Hunter's Moon.

The full moon of October 22 is the so-called Hunters' Moon. On this evening the moon will rise almost exactly at the east point of the horizon while on the following evening it will rise much farther north and only about a half an hour later than on the evening before. For four or five evenings the moon will thus move so rapidly northward on the heavens that this motion will partly overcome its usual retardation in rising. It will rise but about one half hour later on each successive evening instead of about one hour later as is usual. These nights will therefore have an unusual amount of moonlight. The effect was even more marked at the time of the Harvest Moon, which occurred this year on September 23,—the exact day of the Autumnal Equinox.

Retrogradation of Stars.

Pattersonville, New York.

To the Editor:

I noticed in your August number of *THE GUIDE TO NATURE* that you speak of the planet Jupiter retrograding. What is the cause of this motion?

Very truly yours,

CHARLES H. PATTERSON.

University of Pennsylvania,
Philadelphia.

The outer planets all move quite steadily eastward among the stars, completing the circuit of the heavens in a greater or less time depending upon their distances from the sun. Thus Jupiter moves completely around the sun in 11.86 years, Saturn in 29.46 years, Uranus in 84.02 years, and Neptune in 164.78 years. These numbers represent the times that the planets occupy in themselves actually passing around the sun. But we must remember that we do not view them from the sun itself but from our moving earth, which world is itself going around the sun once each year. The resulting *apparent* motions can readily be imitated by turning one wheel inside of another, much larger one and noticing how a point on the inner wheel sometimes passes a point on the outer one and how sometimes these two points are moving in the same direction.

When the earth is between Jupiter and the sun it is moving forward so much more rapidly than Jupiter that, as seen from the earth, the larger planet seems to move backward on the sky, and this backward motion continues until the earth is about sixty degrees ahead of the position of conjunction. When, however, the earth gets on the opposite side of the sun, both its own motion and that of Jupiter make the latter planet appear to move forward: hence at these times the outer planets run rapidly eastward.

Figures illustrating this may be found in almost any astronomy, but the best way is to study it from a small model. A so-called planetarium shows it beautifully, but it may also be clearly shown by merely drawing two concentric circles of different sizes, moving a point around each of the circles, letting the point on the inner circle move the faster, and noticing, (or indicating by drawing lines between the two

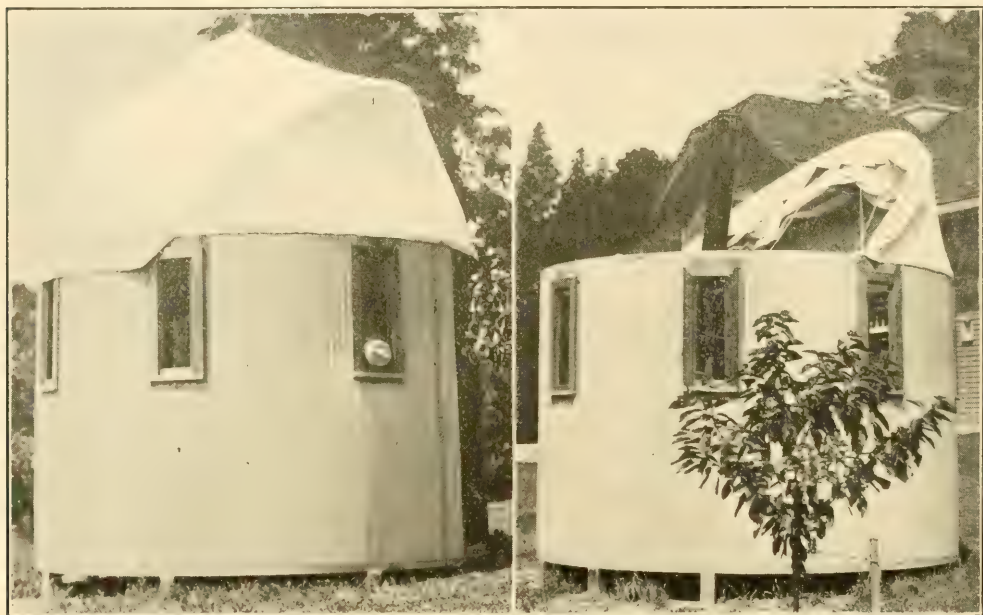
points in their different positions) how as viewed from the inner point the outer one is sometimes moving forward and sometimes moving backward. In the former case the motion of the outer point is said to be "direct;" in the latter it is "retrograde."—Eric Doolittle.

Mr. Warner's Observatory at Tarrytown.

After Mr. Worcester Reed Warner, of the well-known firm of Warner &

collapse, but is braced rigidly, for the barn and the trees hide the horizon, but when it is open, as here shown, I have plenty of room for the pole.

"The foundation is only eight posts set in concrete, the tops sawed off level after hardening. A concrete pier extends from hard gravel to twelve inches below the floor where the broad iron column of the telescope meets it. I should have mentioned that the two quadruple bronze hinges into which the girders screw were made at my factory



TWO SELF-EXPLANATORY VIEWS OF MR. WARNER'S OBSERVATORY.

Swazey of Cleveland, Ohio, had established his residence at Tarrytown-on-Hudson, New York, one of the first things that he did was to erect an observatory. Upon request of the editor, Mr. Warner has sent two photographs, and has written as follows:

"I enclose two views of my new observatory. I think you will find them largely self-explanatory. The building was not quite finished when they were taken.

"Nearly every piece of wood was sawed to length and shape at the mill (except flooring) and my chauffeur did the erecting.

"The girders are four pieces of one-half inch galvanized pipe bent to shape by the erector. The covering was fitted and put on by our local carpet dealer. The northern section does not

in Cleveland. The cost of the building was low, and its efficiency seems high, for the severest storm does not succeed in getting a drop of water inside.

"My telescope is our standard pattern; the objective is seven and three-quarters aperture."

Mr. Warner has gone to California, and on October 2nd, will sail for the Orient, where he expects to spend the winter.

"The wisdom of God receives small honor from those that stare about and with gross rusticity admire His works: those highly magnify Him, whose judicious inquiry into His acts, and deliberate research into His creations, return the duty of a devout and learned (i. e., intelligent) admiration."—Religio Medici, A. D., 1686.

What Visitors See at The Lick Observatory.

Mount Hamilton, California.

To the Editor:

On Saturday nights the thirty-six inch telescope is directed upon the most interesting available object, and the twelve inch upon the next most interesting. With so many visitors it is impossible to show more than one object with each telescope. At this season, in the dark of the moon, the Hercules Cluster and a double star, Epsilon Lyrae, more often than any other usually shown. Jupiter is now getting into position and will be shown to-night (August 28th) with the twelve inch. It is not high enough yet to be convenient for the thirty-six inch.

We ask our visitors to be prompt in taking their places at the telescope, but when there to look till they are satisfied. Some merely glance in, others take two or three minutes or more. Many ask a number of questions which are always answered to the extent of our knowledge.

No lantern slides are shown, but in the main hallway or corridor are five large cases of transparencies, holding from eight to twenty-eight plates eight by ten or larger. These are illuminated by electric lights and the views—sun, moon, comets, nebulae, clusters, spectra, Milky Way, etc.—explained to all who care to hear.

There are also numerous photographs on the walls.

Besides this the clocks, transit instrument, seismograph, weather instruments, etc., are shown and their use explained.

Roughly speaking, about half the Saturday night visitors are content with looking through the telescopes and taking a rapid survey of the building without guide. The rest see and hear as much as possible.

Yours very truly,

R. G. AITKEN.

Mr. Barritt's Good Work.

Every lover of "the grandest of sciences" should have a feeling of gratitude and of appreciation for the excellent work that Leon Barritt, 150 Nassau Street, New York City, is doing in behalf of all astronomical interests. He pub-

lishes "The Monthly Evening Sky Map," subscription to which is one dollar per year and which we cordially commend to our readers. It is a clear, large sized monthly map, and contains many items of astronomical interest. Mr. Barritt has continued this work with a faithfulness that elicits our admiration. The publication cannot be sufficiently remunerative to give him full returns for his time, and he should therefore be considered as an enthusiastic missionary in behalf of the science of astronomy.

Contributions to the Sound Beach Observatory.

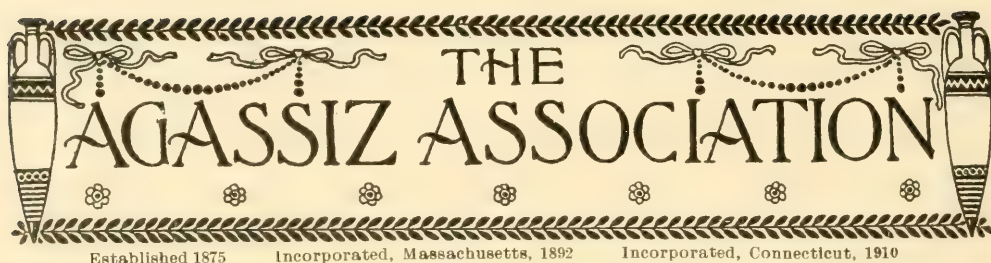
A Friend, Stamford.....	\$ 1.00
Mrs. S. O. Edwards, Sound Beach	5.00
Mrs. W. G. Ihrig, Brooklyn, N.Y.	1.00
Mr. Tamizo Watanabe, Greenwich	2.00
A Friend, Massachusetts.....	5.00
Mr. and Mrs. S. H. Hilliard, Stamford	1.00
Mr. and Mrs. C. W. Payne, Casnovia, N. Y.....	1.00
Antietam Farm, Smithtown, N.Y.	5.00
Mr. John A. Brown, Stamford..	1.00
Dr. F. Schavoir, Stamford.....	10.00
Mr. Robert Stewart, Sound Beach	5.00
A Friend, California.....	1.00
Mr. Charles Andrews, Sound Beach	1.00
Mr. Samuel P. Avery, Hartford, Conn.	25.00

Total\$ 64.00
Previously acknowledged.... 694.08

Grand Total.....\$758.08

"As quick as a wink" proves on the recognition of five different types of Thunderstorm phenomenon. The individuals from 0.035 seconds to 0.049, with a mean of 0.042. In other words, a wink commonly takes about one twenty-fifth of a second.

A promising attempt is now under way to reclaim the waste peat bogs of Ireland by planting them to pine. The ordinary Scots pine of the British Isles will not grow in the peat; but another species, *Pinu pinaster*, has been found to do well. Oddly enough, *P. pinaster* cannot be transplanted to the bogs, but must be grown from seed sown in place.



The Value to Young People of Study and Observation of Nature.

BY MRS. MARIA HERRICK BRAY, WEST GLOUCESTER, MASSACHUSETTS, A NATURE STUDENT EIGHTY-SEVEN YEARS YOUNG.

Life is eternal, and on each of its pages we register what we are. As I look back to the beginning of my earthly life eighty-seven years ago, I am firmly convinced that one of the duties that I owe to the young people of this generation is to urge them to come at an early age into close and familiar companionship with nature.

Nature never fails to give a cordial welcome to every son and daughter who is inspired with love for birds, flowers, ferns, trees and the countless variety of interesting attractions that nature offers everywhere freely and profusely.

Splendid opportunities open to us every day. Years ago Browning wrote:

"— we're made so that we love
First when we see them painted,
things we have passed
Perhaps a hundred times nor cared
to see —"

A deep, reverent love for nature, a real hunger for knowledge concerning simple everyday objects in botany, ornithology, marine plants, things not rare nor seclusive, but as Hamilton Gibson says, "To be found in almost any of our woods or fields, along the seabeaches, and which any wide-awake saunterer may discover with 'half an eye' if that member be properly equipped."

Anticipation is an equipment, the surest "open sesame" to discovery, and anticipation may be quickened either by pictorial hint or previous experience. The brain must be on the alert. A boy

who has woodchucks in his mind as he crosses the farm is sure to see his woodchuck.

Having lived for more than eight decades I feel it a privilege and a pleasure to counsel young people, if they desire to enter into one of the broadest zones of real enjoyment and happiness, where the daily frets and worries of life cannot enter, to begin the observation and study of nature early in life.

I give this counsel from personal experience. I have no recollection of the time when the woods, the fields and the shore of the multitudinous sea, did not have strong attractions for me, nor when I failed to find "Mother Nature" a teller of true and entrancing stories. If you begin early in life to think, study and observe, the wise mother will reveal wonderful stories of planting, growth of leaf, bud, blossom and fruit.

Turn another leaf in "nature's vast storybook," and you become interested in the study of the flowerless plants, lichens, mosses and ferns. After these interesting plants attract your attention, you cannot walk aimlessly through the woods and fields, for as Mr. Underwood declares. "In the entire vegetable world, there are probably no forms of growth that attract more general notice than the ferns."

I recall hours filled with perfect joy in "fern hunts." In a short time the ferns become companionable through observation and study of their names, habits and habitats.

In early life I began to collect sea plants, wild flowers and ferns. The work was full of fascination, and developed within me an insatiable desire for the study and observation of nature. And in these later years memories of the long ago are beautiful; like rare paintings they glow with the colors of

flowers, intermingled with shadows of green ferns and dotted by lichens, grey, brown and in motley, and the humble moss. Such pictures are securely enshrined within my soul. They have been to me blessed consolers in seasons of sadness and sorrow, and now, in the days of my declining years, they bring to me the spirit of peace, joy and cheerfulness.

Then comes the study of the birds, the observation of their habits. Read "Wake-Robin" by John Burroughs. That cannot fail to inspire you with a desire to begin to study and observe the birds that come about your door-yards even in winter, waiting to be fed, and the great army of land birds and sea birds that come with the return of summer.

Olive Thorne Miller truly says, "Ears have they, but they hear not, may be said of many people. Once learn to hear the sounds from nature's vast domain, and observe even a small part of what is wonderful and beautiful in the fields, along the byways, and objects in the open air, countless birds on the wing, you cannot fail to find, not a decrease in your interest in nature's fauna and her flora and the wonders of her world, but an increase of satisfaction and joy that can come from no other source. My last message to my young friends that do not wish to grow old in heart is: Keep in touch with Mother Nature and her old storybook and you will always find that she has a new leaf for you to turn. Finis has not yet been written on her page. Every day it is my experience that

"Spring still makes spring within the mind

When over eighty years are told;
Love wakes anew the throbbing heart
And I am never old."

Nature's portals open wide,

Her gifts are free to all;

Come, let us gather precious store,
Before the frosts of Fall.

—Emma Peirce.

I have lived to be fifty years old and I have troubled myself overmuch with books, yet with a universe of knowledge untouched before me I feel like a child lisping its first lessons. What hope, then, but that the lamp which here dies shall be rekindled in a higher sphere?—"The Phoenix."

Web-like Growth Around a Tree.

Singer's Glen, Virginia.

To the Editor:

This strange tree stands near Lester, West Virginia. The oak seems to have grown up through the maple and



A WEB OF MAPLE AROUND AN OAK.

caused it to take this peculiar shape. I can account for it in no other way.

Yours truly,

HARRY STALEY.

The White-throated Sparrow.

By Elizabeth Van Hovenberg, East Stoneham, Maine.

The white-throat's ringing, bell-like note
Is filling all the air with melody so sweet
and clear,

We seem to feel its mys'try float
About us far and near.

He calls on "Old Sam! Peabody, Peabody,
Peabody!"

Insistant, pleading, earnestly, to
"Sow wheat! cleverly, cleverly, cleverly!"

His little head is lifted high,, his white-throat thrills and throbs,
The notes seem welling to the sky,
As, tumbling from his trembling beak, they burst in swelling sobs—
Of "Sow wheat! cleverly, cleverly, cleverly!"

Insistant, pleading, earnestly, for
"Old Sam! Peabody, Peabody, Peabody!"

Interesting Dog and Kittens.

Willimantic, Connecticut.

To the Editor:—

Herewith I send a picture, taken by my self, of myself, of my white collie dog, and my two white kittens eating their breakfast together. When the kittens were smaller, Duke, my dog,

Credit to Professor Matheson.

Through an oversight, credit to Professor Robert Matheson, Ithaca, New York, was omitted from the article, "Insects that Swim under Water," in our September number. Professor Matheson was author with Professor Crosby in the original publication.



EATING THEIR BREAKFAST TOGETHER.

used to carry them around like the mother cat. Duke likes to play with the kittens and is always careful not to hurt them. The kittens were four weeks old when we got them. They slept in a basket and while they were sleeping Duke would lie down beside the basket. If he thought they were sleeping too long, he would put his nose in the basket and take the kittens out very gently with his mouth and then they would play together. I have lots of fun playing with my dog and kittens.

HELEN ZIPFEL.

Couleur de Rose.

Bright maple leaves a carpet made,
A roof above our heads;
Their wondrous tints were all about,
Beyond the garden beds.

As though sunrise and sunset clouds
Encompassed us around,
And were not melting in the air,
But falling on the ground.

—Emma Peirce.

God speed the good work of making
God's creatures love the works of God
and through these grow to know the
Truth in spiritual fields.—

POULTNEY BIGELOW.

(Personal letter.)

Bluebells at Grand Manan.

All over the cliffs tiny bluebells

Were nodding with exquisite grace,
The solid rock softening and brightening,
As smiles will illumine a stern face.

—Emma Peirce.

Necrology

Mr. Charles T. Wills, of Greenwich, Connecticut, a Member of The Agassiz Association, died in the Greenwich Hospital on Tuesday morning, August 31st. The deceased, one of the oldest and most prominent residents in Greenwich, held many prominent positions in civic and business matters. He was a member of several other scientific organizations, including The Metropolitan Museum of Natural History, The American Geological Society, The New York Botanical Society and The New York Academy of Science. The Agassiz Association extends to members of the family sincere sympathy in their great loss, and to the community for the loss of an efficient business man who devoted a large part of his time and means to scientific interests.

The Agassiz Association and Its Home Are for You.

To create and increase a knowledge and love of nature. You are not too rich, nor too poor; not too wise nor too ignorant; not too young nor too old, to share in their benefits.

VISITING DAYS.

To Members (and accompanying Friends): All Days. Special personal attention, if an appointment is made by telephone or otherwise.

BOARD OF TRUSTEES.

Corporators: Edward F. Bigelow, Ph. D., Sound Beach, Conn., President and Treasurer; Hon. Homer S. Cummings, Stamford, Conn., Secretary; Walter D. Daskam, Stamford, Conn. Other Trustees: Harlan H. Ballard, Pittsfield, Mass., Honorary Vice-President; Hiram E. Deats, Flemington, New Jersey, Business Adviser and Auditor; Dr. David Starr Jordan, Chancellor Leland Stanford Junior University, Stanford University, California, Dean of Council; Dr. Leland O. Howard, Washington, D. C., Naturalist Adviser; Reverend Charles Morris Addison, Stamford, Conn.; George Sherrill, M. D., Stamford, Conn.



*With great regard
yours very truly
L. Agassiz*
Rehoboth, August 25,
1862.

AGASSIZ AS A TEACHER

HE spoke with intense earnestness and all his words were filled with that deep religious feeling so characteristic of his mind. For to Agassiz each natural object was a thought of God, and trifling with God's truth as expressed in Nature was the basest of sacrilege.

And the Summer went on, with its succession of joyous mornings, beautiful days, and calm nights, with every charm of sea and sky: the master with us all day long, ever ready to speak words of help and encouragement, ever ready to give us from his own stock of learning. The boundless enthusiasm which surrounded him like an atmosphere, and which sometimes gave the appearance of great achievement to the commonest things was never lacking. He was always an optimist, and his strength lay largely in his realization of the value of the present moment. He was a living illustration of the aphorism of Thoreau, that "there is no hope for you unless the bit of sod under your feet is the sweetest in this world—in any world." The thing he had in hand was the thing worth doing, and the men about him were the men worth helping—David Starr Jordan in "Agassiz at Penikese."

To Non-Members (not accompanying Members). Wednesdays and Saturdays, 3:00 to 5:00 P. M., and at other times by Special Invitation and Appointment. ARCADIA is not a Museum, not a Botanical Garden, not a Zoo. Yet at different times it has a few special interests (under special study) along some or all of these lines. Our purpose is not so much to exhibit nor to entertain, as to create a desire to do what Agassiz so insisted upon—that is, to "STUDY NATURE."

Chapter Organization Expense

Entrance Fee	\$1.25
Handbook, "Three Kingdoms"....	.75
Engraved Charter, in tube.....	1.00 \$3.00

ANNUAL DUES—PAYABLE IN ADVANCE.

The Annual Dues for Chapter..	\$2.00
Annual Dues Members of Chapter	Members @ 5c
each	— \$ —
Total Necessary Expense to Chapter upon Joining the Association	\$ —

Corresponding Member's Expense

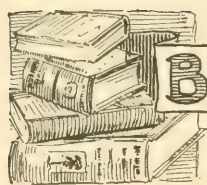
Entrance Fee.....	\$0.25
Handbook, "Three Kingdoms"....	.75
Certificate of Membership.....	.50
Annual Dues	\$1.50
	1.50
	\$3.00

Student Members are required to make a report at least once a year. This report should contain not only a statement of work done, but of "the promotion," "the advancement," etc. See quotation from Charter. We are to help others as well as ourselves. Extend the influence of the AA.

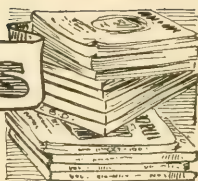
The Annual Dues include payment for subscription to The Guide to Nature.

COOPERATING MEMBERSHIPS

Sustaining Member (annually)	\$5
Sustaining and Honorary (annually) ..	\$25
Life Member (paid at one time)	\$100
Patron (paid at one time)	\$1,000
Founder	\$5,000
Benefactor	\$25,000



BOOKS and MAGAZINES



Propagation of Wild Birds. By Herbert K. Job. Garden City, New York: Doubleday, Page & Company.

"Louis Agassiz Fuertes,, the artist of bird

rare or unusual one. Bless his artistic soul! A thousand times, yes! It is one of the most entrancing emotions; and the person is fortunate indeed who knows it from fre-



Crows shot by a farmer in Connecticut, and hung up by his house



Mourning dove, now the principal "wild pigeon" of North America

life, once asked the writer whether he ever felt a sort of rapturous thrill when in close proximity to a wild bird, especially with a

quent experience."

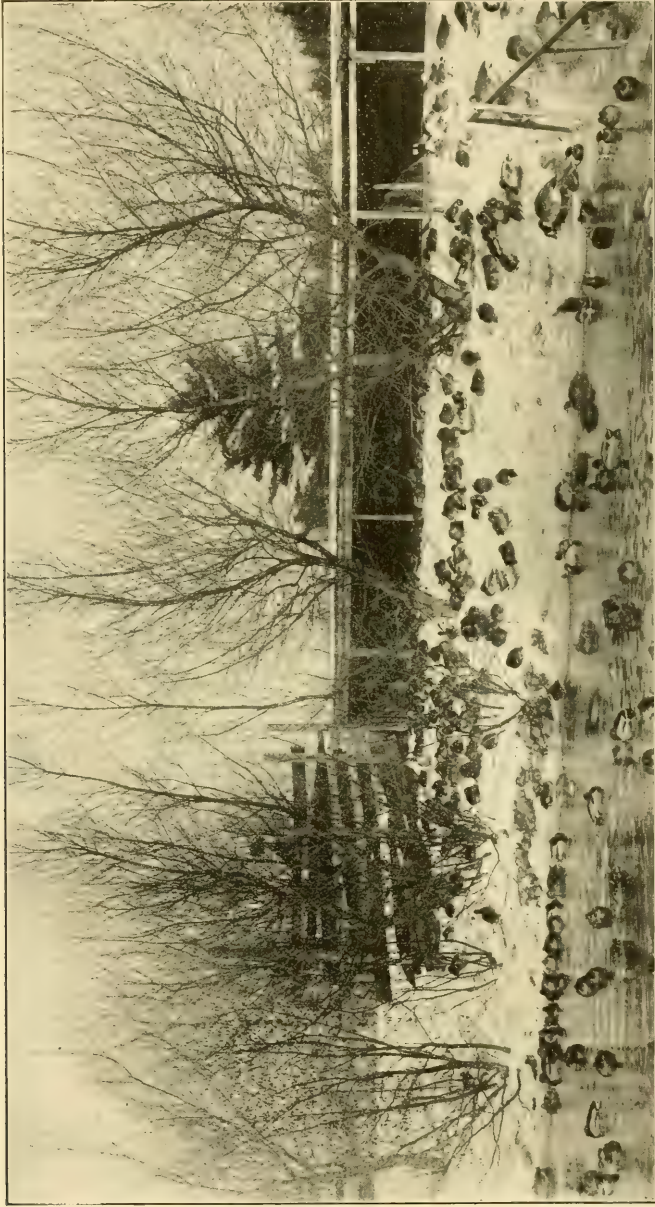
Thus speaks the author of this book, the first and only popular manual to give prac-

tical directions for the attracting and the conserving wild bird life.

The scope of the work is set forth in a prefatory note by T. Gilbert Pearson, Secretary of the National Association of Audubon Societies, as follows:

"There has grown up in the United States, within the past ten years, a wide-

"As a natural consequence of these manifestations of interest on the part of the public, there has appeared an increased desire to have birds come about the home in greater numbers. People are wanting more robins on the lawn, more wrens in the garden, and more bluebirds, thrashers, and woodpeckers in the neighborhood.



Photograph by the Courtesy of John Heywood

Mr. Heywood's method of wintering waterfowl, in most places the best method. A picture which tells the story

spread interest in birds, the extent of which has never been equalled in this or any other country. Along with the desire to acquire more knowledge regarding the habits and activities of these feathered denizens of the great Outside has arisen a sense of personal obligation to aid all movements that tend toward safeguarding their lives and prolonging their usefulness.

"I recall that less than ten years ago I spent much time in an effort to induce a certain man to begin the manufacture and sale of nesting-boxes for birds and similar apparatus, with the view of supplying a demand which I felt was certain to come. It was with very great difficulty that he was induced to go into this business. To-day there are more than twenty well-known

manufacturers of bird-boxes and other bird-attracting apparatus in the eastern part of the United States alone.

"It has not been a great many years since an estate on which pheasants and wild ducks were reared was a curiosity and occasioned much local comment. To-day hundreds of persons are engaging in this pleasant and

the shore of a small pond close to several species of wild ducks in all the glory of their nuptial plumage. The previous season out in the wilds of northern Manitoba I had hatched these ducklings in an incubator, raised them by hand, and had brought them under my personal care more than two thousand miles to the spot where

I sat. The wonderful canvasbacks were diving and eating the succulent roots which they brought to the surface. The light glanced resplendent from their delicately pencilled backs and gleamed in the fiery eyes of the males. Was it tedious to sit there so long in the cold April wind? Nay, rather in my delight I was oblivious to the passing of time.

"Much the same feeling may be kindled when a pair of bluebirds, wrens, or chickadees accept our hospitality and raise a brood or two in one of our nesting-boxes; or when the chirping sparrows and phoebes use the building material we have put out for them, and nest in the woodbine or under the porch by our very door."

The author asserts that the propagation of wild birds for food or for other practical purposes is going on to a greater extent than ever before. He showed the legitimate basis

of such propagation, and how the work of the Audubon Society has created a new field for scientific research.

The book is divided into three general divisions. In the first part, "Methods with Gallinaceous Birds, and Others," it treats of the wild turkey, the pheasant, the pigeon. In the second part, "The Propagation of Wild Waterfowl," it deals with wild ducks, wild geese, swans, wading birds, and similar types. In the third part, "Methods with the Smaller Land Birds," the person just beginning the study will perhaps find the most interesting material. Here the author discusses such important fundamental matters as nesting-boxes, nesting material, water supply, attractive vegetation, suppression of enemies, etc.

The book is profusely illustrated with excellent photographs that have not only artistic merit, but well illustrate the practical parts of the subject.

From the Agricultural Experiment Station at Madras, India, comes the report of successful experiments on feeding cattle with dried fish. The diet is by no means ideal, but serves to keep the creatures alive when the grass fails.



Photograph by Com. George H. Graham of Mass.

U. S. Senator George P. McLean feeding young ruffed grouse reared on his estate at Simsbury, Connecticut

profitable occupation. Naturally much well-meant effort in this direction has been ill-directed; and it has become evident that there is great need of some one highly skilled in the matter of artificial propagation of birds to give counsel to those desiring to undertake an enterprise of this character.

"It was to meet this demand and provide expert advice for those desiring to begin the raising of game-birds, or to make bird-sanctuaries of their groves and fields, that I arranged for the National Association of Audubon Societies to establish, in 1914, its 'Department of Applied Ornithology.'"

In his introduction Mr. Job points out that the work of the Audubon Societies looking toward the propagation of wild birds is really a movement in direct line with the great national desire for the conservation of the natural resources and beauties of the country. Up to about 1875 birds of all sorts were slaughtered for food, for their plumage or for the mere sport of killing. But at that time the economic value of bird life began to dawn upon a few thoughtful minds, and the effort ever since has been to prevent the useless killing of birds.

In another place he describes the joy to be found in helping the birds in their unequal struggle for life:

"Recently I sat for more than hour on

The Guide To Nature

Fie upon thee, November! thou dost ape
The airs of thy young sisters; — thou hast stolen
The witching smile of May to grace thy lip,
And April's rare capricious loveliness
Thou'rt trying to put on!

Julia C. R. Dorr

Vol. VIII November, 1915

No. 6

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ARCADIA: SOUND BEACH, CONNECTICUT

EDWARD F. BIGELOW, Managing Editor

Subscription, \$1.00 a Year. Single Copy, 10 Cents

GREENWICH

THE EDITION DE LUXE
OF CONNECTICUT TOWNS

GREENWICH

As Trustee

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THE STAMFORD NOTE BOOK

Inspiring for Late Autumn and Winter

One of the most stimulating and satisfying stores is that of The Lockwood & Palmer Company in Stamford, Connecticut. Any lover of suburbs or of country that enters this store will love the home and its surroundings and nature better than ever, and will see that here are satisfying equipments of every kind.

If you are interested in building, harvesting, care of chickens, the cultivating of vegetables on the farm, in repairing and painting the buildings for the winter, if, in fact, you are interested in anything connected with a home near to nature, then here you will find the best of everything with reasonable prices and courteous treatment.

A store so well equipped and managed is not only a commendable business enterprise for the owners, but is to the visitor educational and suggestive. It tends to make living in the country enjoyable and efficient.

Stamford's Biggest Candy Kitchen.

It is fifteen years since the Olympia Candy Company started in business on Atlantic Street, Stamford, Connecticut. Their growth, the result of painstaking endeavor to please the public, has been steady.

The crowning point of their success has recently been celebrated by several changes and improvements. They have installed the largest and best refrigerating plant in this vicinity, at a cost of more than two thousand dollars, and with a capacity of six tons. The working rooms have been extended. A new ceiling and a new tile floor have been put in. The entire establishment is beautiful, convenient, spacious, attractive. A large variety of candy always fresh and ice cream always delicious is kept at all times. Everything about this popular store is inviting.

A three-year-old girl became interested in a peculiar noise and asked what it was. "A cricket, dear," replied the mother. "Well," remarked the little lady, "he ought to get himself oiled."—Christian Register.

Cheering.—Mistress—"I shall be very lonely, Bridget, if you leave me."

Bridget—"Don't worry, mum. I'll not go until ye have a houseful of company."—Boston Transcript.

Come out into the sunshine
Why stay cooped up in-doors?
This sparkling morning tonic
Is always freely yours.

—Emma Peirce.

A well-to-do Scottish lady one day said to her gardener:

"Man Tammas, I wonder you don't get married. You've a nice house, and all you want to complete it is a wife. You know the first gardener that ever lived had a wife."

"Quite right, missis, quite right," said Tammas, "but he didna keep his job lang after he got the wife."

The codfish lays a million eggs,

While the helpful hen lays one;

But the codfish does not cackle,

To inform us what she's done;

And so we scorn the codfish cod,

But the helpful hen we prize;

Which indicates to thoughtful minds

It pays to advertise.

W. A. McCLELLAND

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whether business or social, can be supplied here to the best advantage. Variety, quality, price, all in your favor. We would especially like to show you



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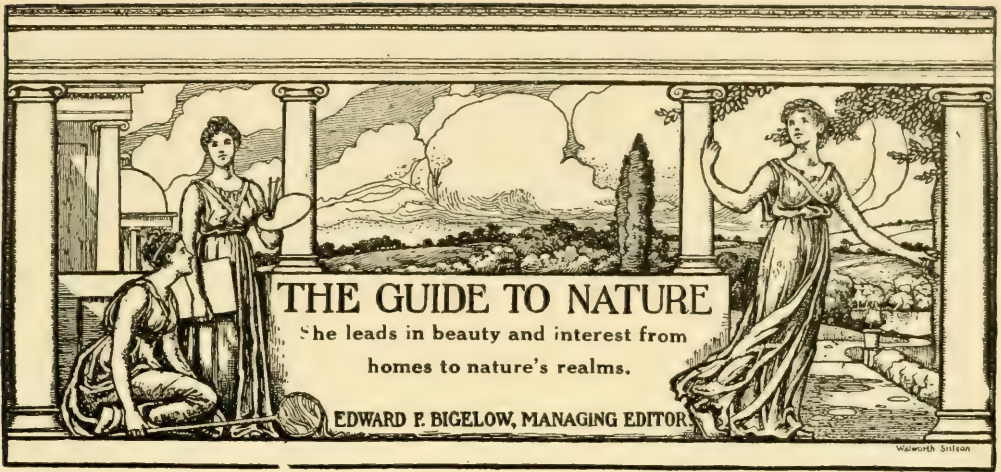
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STAMFORD - CONN

TELEPHONE CONNECTIONS



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Volume VIII

NOVEMBER

Number 6

A Lake of Possibilities and Difficulties.

By EDWARD F. BIGELOW, ARCADIA: Sound Beach, Connecticut.

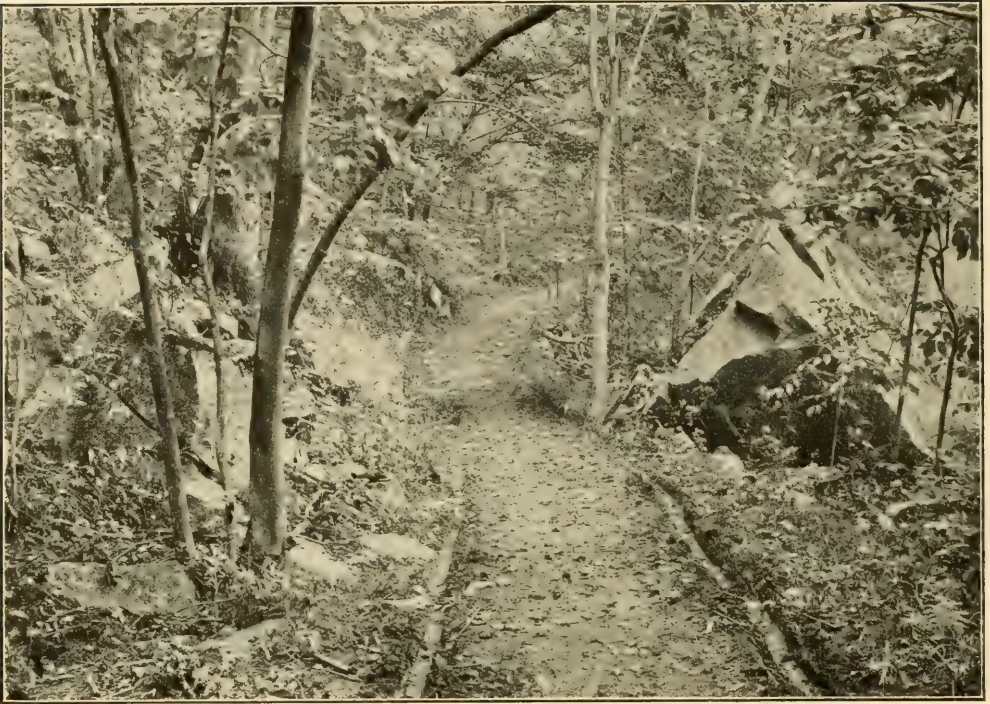
MR. Ernest Thompson Seton for the past three years at his new home that he calls "The Fincherie" has been engaged for about three months each year in developing or transforming a pestilential marsh into a picturesque lake. This famous naturalist quite evidently likes to do that kind of a thing, because on his former estate—"Wyndygoul"—he had an extremely interesting lake that was almost wholly his development, nature provided only the water and a very nice possibility so that the attempt met with a great many difficulties in order to get the water back enough to flow over a large stretch of territory and in giving the whole thing a really natural appearance. One would never think of calling it a pond, because it really was a lake to all intents and purposes.

Here at his recently acquired property there are greater possibilities and greater difficulties in producing the desired effect but on the whole, the plan seems to give promise of far greater results than did his former lake. The road by the side of the lake has every picturesque advantage and the view from the south looking up the lake is beautiful in the extreme. Mr. Seton says, "I am a little shy about giving information concerning the lake plan

just now because so much of it is problematic. I never know what the difficul-



MR. SETON ADMIRES THE STUMP PULLING MACHINE.



"THE ROAD BY THE SIDE OF THE LAKE HAS EVERY PICTURESQUE ADVANTAGE."

ties are till I come to them, so I cannot say in advance how I am going to solve them. Bog, rock and level flat all require

separate treatment." However great are the difficulties, he will overcome them.

I remarked to a friend who visited the



THE MEN GO OUT IN BOATS TO ATTACH A WIRE CABLE TO THE STUMPS.



IN THE LATE AFTERNOON.

locality with me, "How is it that such a the right hands?" His reply was: "When marvelous locality could have been here the gods wish to have a work done, they all these years and now fall into exactly not only provide the work but they keep



ONE OF THE MANY SCENES AMONG FALLEN TREES.



"THE VIEW FROM THE SOUTH LOOKING UP THE LAKE IS BEAUTIFUL IN THE EXTREME."

it until an opportune time and then they provide the man."

That seems to be the solution to the whole situation. Mr. Seton has had experience; he loves the work; he knows nature; he has an artistic eye and the requisite knowledge and financial facilities to carry the thing through successfully. He does not work at it with feverish impatience nor with the air of a contractor who must rush the job. He employs a few men and makes use of a powerful little machine that has a capacity to draw between forty and fifty tons

through the labor of two men who work a long lever. Huge trees are moved bodily by this Oregon stumper and dragged bodily from the lake bed to the roadside. The stumps are dragged with a large mass of earth as much as a thousand cubic feet at one pull to form ready planted lake borders or enchanting islands, so that a canoe trip of this mile long lake will be a trip of exploration with vistas and surprises at every turn.

It is quite evident that here is thoroughly original work and there is not much precedent to go by, but the impression



MR. SETON IS MUCH INTERESTED IN SKUNK FARMING.

given to a visitor is that the problems are quickly being solved and that here will be one of the most novel and picturesque lakes covering about a dozen acres and with a permanent depth of some eight feet of water. The lake will be stocked with fish, but the prime idea is not the fisherman but the naturalist; not a landscape decoration, but artistic satisfaction.

Mr. Seton is well known the world over as being interested in skunk farming, and, after returning from the lake with him, he kindly consented to pose at the feeding time of his favorite pets. He also has two lynxes or bobtailed cats from the Rocky Mountains, and he derives much pleasure in studying their characteristics. There, under close observation, are several of our wildest and shyest animals, including minks, martens, sables, coons and others.

There is every indication that this will become, under the transforming hand of this famous naturalist, one of the most beautiful and natural developments and a real bird and animal sanctuary.

Fall Dandelions.

Like golden stars throughout the browning grass,
These tardy blooms appear to those who pass;
A message of good cheer they have for most,
Late lingerers of Summer's blossom host.
—Emma Peirce.

Laying Eggs on Time.

Go with your clock to the clock maker's to have it repaired. Probably a dozen people will say, "I see that you are going to be on time as you are carrying it with you." Nowadays time is in the atmosphere. How soon can you do it? How soon can I get there? Oh, Central, be quick; I am in a hurry! Is this the fastest train? We discuss the number of hours that shall form a working day, and some predict that that day will soon be shorter than it now is. Time is in the air. It seems conclusive from circumstantial evidence that even the hens are considering the matter. One can easily fancy that over in Cos Cob during one of these discussions one of the egg layers arose to a point of order and said, "What is the use of this discussion? Human beings have clocks but we haven't." Then arose a Yankee biddie. "Necessity is the

mother of invention!" she laconically remarked. "If there is a need there is almost always some method of supplying that need. It is therefore evident to me that all this discussion should have some effect on our egg laying." Therefore sitting down to the situation, the hen produced an egg with a clock face on it.

Some reader may be so bold as to believe that this is only a dream. But is



THE "HOUR" MARKS ON THE EGG.

The white ridges were marked with pencil in order that they might show clearly in the photograph. Mrs. Gotthold explains that the hen escaped from the yard into the flower bed and fed from a bed of thyme!!

this the photograph of a dream? A hen's egg with a clock dial on it, and put there by the hen? The egg was kindly contributed to ARCADIA by Mrs. Frederick Gotthold, one of the Members of The Agassiz Association.

The new building for the Field Museum of Natural History in Chicago is at last under way, and is to be completed in three years. Seven hundred feet by three hundred and fifty are its dimensions; while its floor space will amount to more than fifteen acres, of which nearly ten acres will be given over to exhibitions. Some three thousand men will be employed on the structure, which when completed will be, the largest marble building in the world, and one of the largest museums.

A Remarkable Piece of Veneer.

The illustration shows a remarkable specimen of rotary cut, yellow poplar

labor and delicate machinery were required to cut such a piece of wood without splitting it. In addition to this,



veneer, one-eighth of an inch thick, ten feet wide, and thirty feet long. It is to be used as a ceiling panel for an electric street railway car. Much skill,

think of the skill required to fit it to the ceiling and put it in position as one entire ornamental design.

We are indebted to "American For-

estry for the use of this remarkable illustration, taken from an interesting article entitled "Commercial Uses of Tulip or Yellow Poplar." "American Forestry," beginning with the August number, has made a remarkable advance. The magazine is enlarged and in every respect improved; the quality of the paper is good; the printing is first-class, and the reader must wonder where the editors find so great an amount of interesting material pertaining to our forests.

Squirrel Burying a Nut.

BY EWING SUMMERS, WASHINGTON, D. C.

For the first time in my life I saw a few days ago the beautiful and interesting operation of a squirrel burying a morsel of food. As I was passing a park I noticed the dear little creature working with all his rapid might, with his nose close to the ground not more than two feet from the sidewalk, and was surprised that he did not notice me, he was so enthusiastic in his task. Having been drilled for many years by nature study writers into the importance of close observation, I immediately thought that now there is a golden opportunity for putting the principle into practice. The provident little animal was digging a hole in which to bury a peanut which he was holding in his mouth with ends up and down, not horizontally. There was a wise object in this, as we shall presently see. On his finishing the excavation I noticed that it was about two inches wide at the top and two inches deep. He stuck the peanut down endwise into the bottom of the hole as tightly as he could and commenced to cover it, not as we men would, by pawing in the loose earth thrown up, but by tearing in the unbroken earth next the peanut. At first I did not discern the reason of this, but I soon saw it. He saved the soil first thrown up for the final covering, so that it would not be of a color different from the surrounding surface. With his characteristic quick movement, as rapidly as a small dead leaf tree fluttering in a violent wind, he finished off the surface by skillfully patting it down so swiftly I could not see what he was doing, and jerked a dead leaf over the center and scampered away, and not till then did I discover what he had done. I peered at the completed task closely and could not see

even the least marking to show that the surface had been disturbed!

Now the object of his plunging the peanut down endwise at the bottom of the hole was evidently to facilitate taking it up when he came to dig up the store, by grasping the upper end with his mouth as soon as he reached it, without having to dig more for it had it been laid horizontally. How he can ever find the place again, I cannot imagine. Can any of my readers suggest? The odor of the soil is much stronger than that of the nut. We men would have to describe the exact point in surveyor's terms, as for instance, so many feet and inches from a certain designated tree, north 202° mm 37 east.

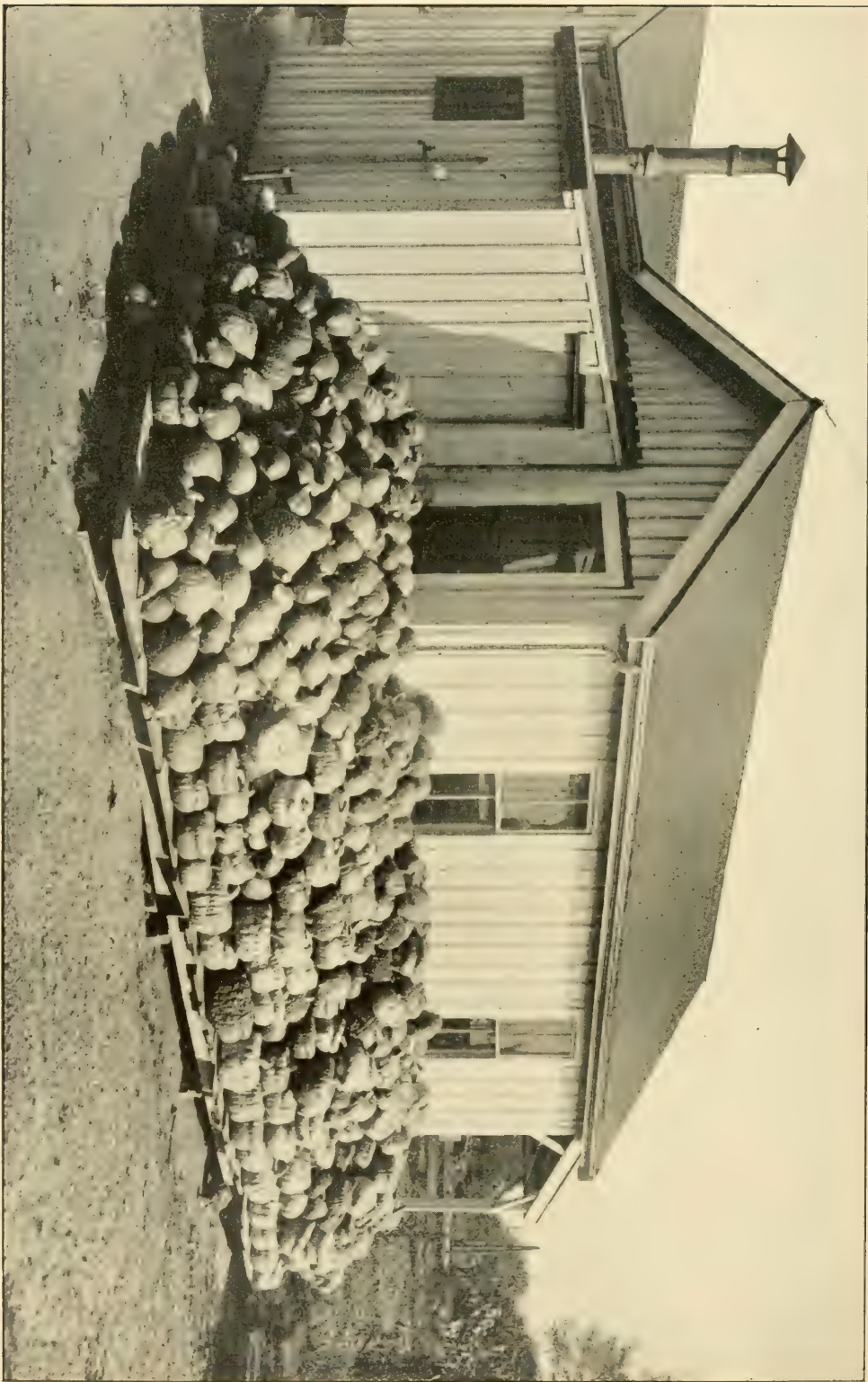
Well, after the squirrel had run off about twenty feet from me he noticed that I did not go along about my business as a decently behaved man ought to, and his suspicions were aroused. So he reared up into a statuesque position to watch me. I took the warning and passed on, and then he passed on his way.

Studies of the White Pine.

The seasonal growth of the white pine is the subject of a careful study by an English botanist. He finds that increase begins in March with the expansion of the soft tissues without cell division. Late in April, the tissues begin to divide—at first rapidly, then more slowly. Growth begins in the trunk, near the top, and spreads both upward and downward, reaching the tips of the branches some time before the base of the tree. The butt, however, continues to grow after the crown has stopped. The total growth period is about five and a half months.

Rate of growth depends largely on the temperature, and varies from day to day and even from hour to hour. It is most rapid in May and early June. It then becomes less rapid, only to take a new spurt in July and August. Increase is, however, not the same at all levels in the tree, though in the end the differences are evened up.

New wood begins to form early in August, starting at the top. The new shoots, however, stop elongating about the beginning of July. But the needles continue to grow until more than a month later.



HONEYBEES HELPED PRODUCE THESE EIGHT TONS OF SQUASHES.
(Cut by courtesy of "Gleanings in Bee Culture," Medina, Ohio.)

The Value of Bees in Fertilizing Squash Blossoms.

BY SUSAN E. HOWARD, STONEHAM, MASSACHUSETTS.

Replying to your inquiry as to the value of bees to my squash and small fruits, I would say they are of the utmost importance, and they have been a great factor in my success in growing squashes. The development of a small orchard and fruit growing are secondary to my bee interests; and while the trees and bushes are growing, I utilize the land by planting catch crops and fertilizing or cover sowings. The eight tons of squash shown in the picture were grown on five-sixths of an acre, which also carried 115 two-year fruit-trees and 600 one-year currant bushes.

The squash followed a crop of 54 bushels of green peas, which were harvested before the squash were ready to spread.

As recorded in *Apiarian Bulletin* No. 8, Massachusetts Department Agriculture, it was no uncommon occurrence to note four to six bees in a squash-blossom at one time, happy and contented. I have also counted 28 bees within an hour in one squash-blossom. The squash crop was the banner one for this section, for the land occupied, and was in marked contrast with results at a distance from my apiary.

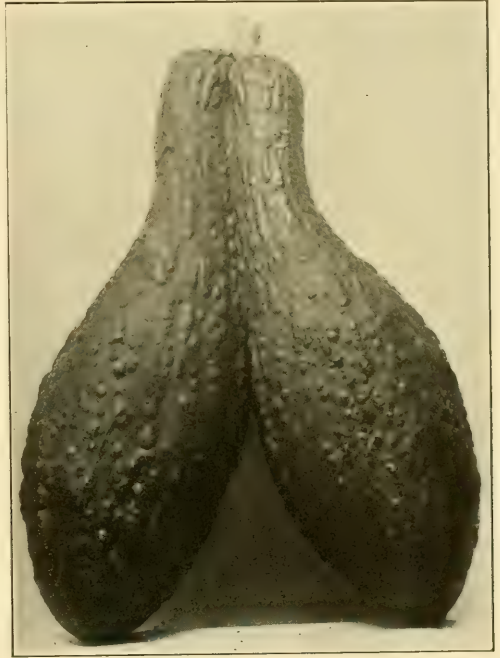
To people who realized in a measure the good work performed by the bee it was a revelation, and substantiated my oft-repeated statement, "bees as flower fertilizers first, and honey production an after-consideration."—"Gleanings in Bee Culture," Medina, Ohio.

Forest fires, during the last year, burned over six million acres, and did about ten million dollars' worth of damage. More than half these fires were due to pure carelessness—in no small measure to campers.

Of the four or five thousand fires reported each year in our national forests, slightly more than a third are attributed to lightning. The largest proportion of thunderstorms come between three and five o'clock in the afternoon; the smallest, within an hour after midnight and between seven and eight o'clock in the morning. Thunderstorms are most frequent in June, rarest in December and January.

A Twin Squash.

A remarkable twin squash, of which an illustration is here shown, was grown in Mr. Stanley Tompkins's garden at Glenbrook, Connecticut, and forwarded to this office by Miss Lottibelle Tompkins. We have re-



THE TWIN SQUASH.

ceived other forms of twin fruits, such as apples, plums, strawberries, tomatoes, etc., but this is our first twin squash. It is a fine specimen.

Students of mankind are taking advantage of the vast numbers of Russian prisoners of war to push the study of Russian anthropology. To a single investigator, for this purpose, the Vienna Academy of Sciences has lately made a grant of nearly a thousand dollars.

Bronze and Gold.

The maple fires have come and gone,
And earth would be left drear,
But that the bronze and gold of trees
Are left to give us cheer.

The beech and birch and aspen gold
Is gold without alloy,
And with the richness of the oaks,
A late Autumnal joy.

When they are gone, then all is gone,
And Fall's parade is o'er;
But Winter has its beauties too,
A richly varied store.

—Emma Peirce.

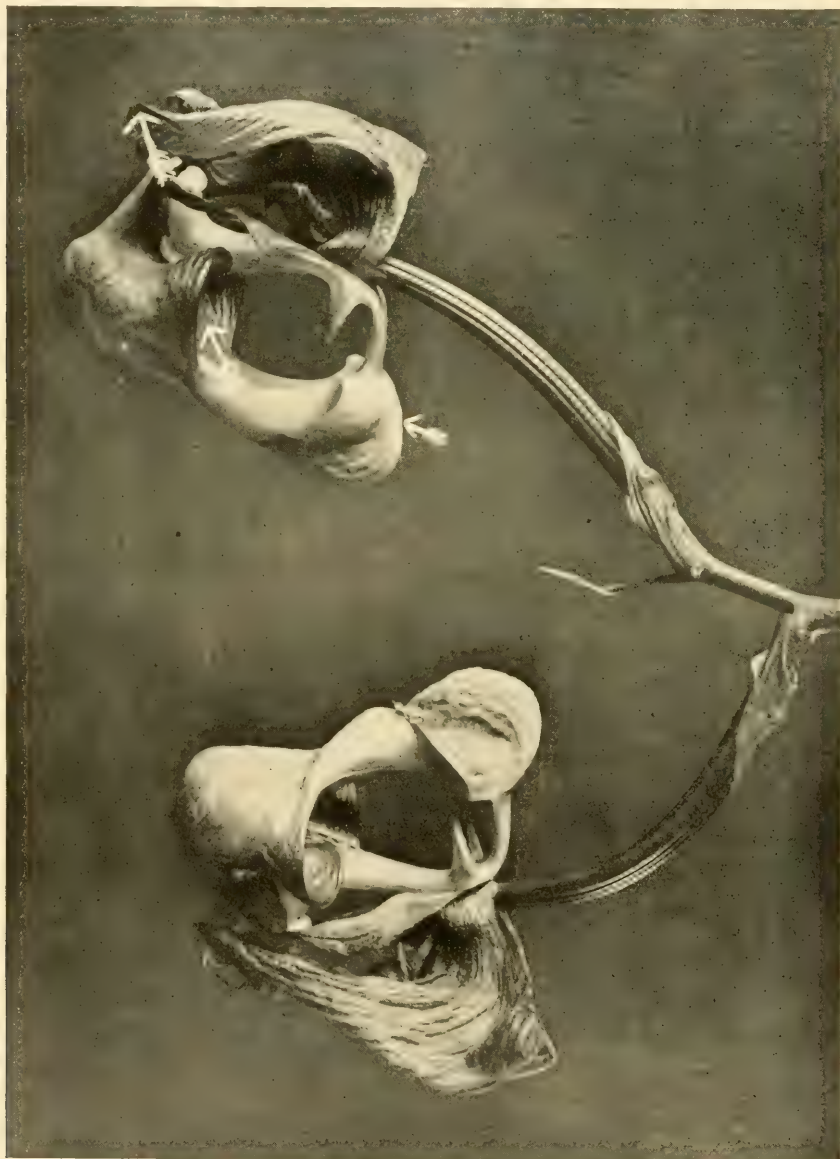
The Bucket Orchids.

These are so unusual and grotesque in their appearance and structure that there is nothing quite like them found among the great variety of orchids, or even in the entire plant kingdom. Perhaps nowhere is the curious structure of this group of orchids more conspicuous than

from which the plant receives its common name. Unfortunately, the flowers are of such short duration and the plant itself is so difficult to cultivate, that few have had the pleasure of seeing this floral curiosity.

* * * * *

Dr. Cruger, formerly Director of the Botanic Garden at Trinidad, writes as



BUCKET ORCHID FLOWERS.

Arrows show route of pollinating insects.
Cut by courtesy of the Missouri Botanical Garden Bulletin.

in the genus *Coryanthes*, of which there are upwards of a dozen species indigenous to tropical America. The partially opened buds resemble a bat at rest and when the flower is fully opened it reveals a "bucket," which holds the nectar and

follows of his observations of the insects which pollinate the flowers:

"Large humble-bees, noisy and quarrelsome, are attracted at first by the smell of the flower; but the smell probably only gives notice to the insects; the substance

they really come for is the interior lining of the labellum which they gnaw off with great industry. They may be seen in great numbers, disputing with each other for a place on the edge of the hypochile. Partly by contrast, partly perhaps intoxicated by the matter they are indulging in, they tumble down into the 'bucket' (epichile) half full of the fluid secreted by the horn-like organs at the base of the column. They then crawl along the anterior inner side of the bucket where there is a passage for them. If one is early on the lookout, as these hymenopters are early risers, one can see on every flower how pollination is performed. The humble-bee in forcing its way out of its involuntary bath has to exert itself considerably as the mouth of the epichile and the face of the column fit together exactly and are very stiff and elastic. The first bee that is immersed will have the gland of the pollen masses glued to its back. The insect then generally gets through the passage and comes out with this peculiar appendage, to return almost immediately to its feast, when it is generally precipitated a second time into the bucket, passing out through the same aperture, and so inserting the pollen masses into the stigma while it forces its way out, and thereby pollinating either the same or another flower. I have often seen this, and sometimes there are so many of these humble-bees assembled that there is a continual procession of them through the passage specified."—"Missouri Botanical Garden Bulletin," St. Louis, Missouri.

Regent's Park, London.

BY DR. C. H. MYERS, CHATTANOOGA,
TENNESSEE.

The Gardens of the Zoological Society, situated in Regent's Park, London, occupy more than thirty acres in the northern portion of the Park adjoining the grounds of the Botanical Society and the Archery Society. The Society is very old, having been founded by Sir Humphrey Davy and Sir Stamford Raffles in 1826. Naturally it is a Mecca for children, and hundreds are familiar with the elephants and the dromedaries, the pelicans and the parrots of this famous zoo. The band plays for the children on Sunday afternoons. Many Parks are inhumane enclosures, where beasts and birds suffer from improper feeding and limited space. The photograph herewith will serve to show the remarkably fine provision

made in Regent's Park. Rock and cement have been used lavishly to reproduce as nearly as possible the habitats of the animals. At the left background are the rocky crags for antelopes, mountain goats and gazelles. There are also furnished spacious paddocks. In the foreground is the polar



A POLAR BEAR IN CAPTIVITY UNDER GOOD CONDITIONS.

bear's pond. This healthy white specimen is a good illustration of the possibilities in well-conducted zoological parks—which constitute one of the finest of educational institutions.

The famous asphaltum beds of southern California have preserved many interesting remains of animals which have become engulfed in them. A collection of more than two thousand specimens from these deposits has lately been acquired by the Field Museum of Chicago. Among other bones, are those of the sabre-toothed tiger, the mastodon, bison, a giant sloth similar to the *Megatherium*, with various cats, horses, deer and the like. Nearly everything is of the time of the Glacial Period.

Moles, and Their Relation to Agriculture.

BY DR. R. W. SHUFELDT,
WASHINGTON, D. C.

In the present article it is my purpose to touch upon the natural history of moles, and in what way their presence on the farm may affect the farmer's interests—that is, should he regard them as his enemies or as his friends. What I have to say is chiefly from personal observation, as I have, for many years, had

of these, while in the case of others we still have much to learn about them.

One of the most striking species is the star-nosed mole, *Condylura cristata*, so called on account of the peculiar fleshy rosette of feelers ornamenting the distal end of its snout. This mole is not very abundant anywhere; and, owing to its habits and to its being a semi-aquatic swamp species, it is but rarely observed. I have never seen but three of them in my life. One of these was a



A COMMON MOLE CAPTURED NEAR WASHINGTON, D. C.

the opportunity to study moles in nature, in the museums, and in my own laboratory. The two photographs from which the cuts that illustrate this article were made were taken by myself of a specimen of a common mole, captured near Washington, and presented to me by Mr. Edward S. Schmid of that city. It was an adult male of the species found in the eastern part of the United States, *Scalopus a. aquaticus*, and its skeleton now forms a part of my private cabinet. It will be a surprise to some to learn that we have so many different kinds of moles in this country, although they all belong to the same family, *Talpidae*. Most naturalists recognize four genera of them, and these four genera together contain no fewer than twenty different species and sub-species of these interesting little animals. We are fairly well acquainted with the habits of some

dead specimen; another escaped me after an exciting chase, while a third I captured alive on the border of a swamp near Stamford, Connecticut, and had the opportunity to study it for a short time.

Brewer's mole has never been seen alive by me, nor any of the Pacific Coast forms of the genus *Neirotichus*, or, indeed, any living examples of the common mole of Europe, *Talpa europaea*; so the present account may be said to apply only to the eastern United States species, and to such other species as chance to agree in their habits.

All moles belong in the order *Insectivora*, where they are, in this country, associated with the shrews, of which interesting little animals there are a great many kinds. Our common mole does not appear to be particularly abundant in any locality, though it is fairly so in many parts of its ranges. Every farmer

and gardener in the Northern and Middle States are more or less familiar with them, and, as a rule, they destroy them whenever opportunity offers. When asked why they do this, the usual answer is that moles disfigure the lawns and grass-plots with their long burrows; that they uproot plants and feed upon garden vegetables. How true all this may be will be discussed further on in the present article.

The entire structure of a mole fits it for the life it leads, that is, underground, in the long passages it digs, and in the subterranean nest it constructs, as a home in which to rear its young, these latter ranging in numbers from two to nine. Burrows dug by these animals have often been found to be upwards of one hundred and fifty yards in length, and may, in some instances, even far exceed that, as it has been so stated by writers on the subject.

They rarely come out in winter, unless the weather be very mild, as they do not endure cold well, notwithstanding the thick coat of close fur they have. On one occasion, however, during a thaw in January, I saw a mole scamper over the snow and disappear into one of its burrows before I could overtake him. At this season their passages are much further beneath the surface of the ground than they are during the summer months, which is the season of their greatest activity.

Moles live almost entirely upon various kinds of insects and their larvae, which they come across while making their burrows. They also partake very largely of angling worms; and one that I had a short time in captivity appeared to be very fond of raw beef. They are in no sense of the word vegetable-feeders or seed-eaters, as the agriculturists usually say they are; depredations of that sort are now readily traced to those field mice which make use of the galleries of the moles in getting about underground.

It is truly astounding what a number of angling worms a mole will eat in the course of twenty-four hours, and few animals are more dependent on their food than moles. If one be kept in a big box with a foot of clean earth in it, the animal will not live over fifty-six hours, if it is not regularly fed on worms, meat, or such insects as it feeds upon in nature. Should another mole be placed in the

box to keep the first one company, the stronger animal will, if very hungry, kill and devour the weaker one. In other words, under certain conditions, moles are cannibals, killing and eating their own kind.

Most of the insects which moles consume in great quantities feed upon the roots, leaves, and other parts of garden



A DETAILED MOLE STUDY.

vegetables, or, in some instances, upon the vegetables themselves. In this particular, then, these little animals are of decided benefit to the gardener, the agriculturist, and the farmer. Occasionally, in their search for food, they will uproot a plant or two, or rip up the lawn with a superficial burrow; but such slight offences are as nothing compared with their most useful services in destroying the insect enemies of garden and farm.

Throw open the casements and fling wide
the doors,

Let in all the sunshine and air;
'Tis better by far than your potions and
pills,
And the M. D.'s most vigilant care.
—Emma Peirce

Is This the Largest Elm:

On page 396 of *THE GUIDE TO NATURE* for May we published an article and illustration borrowed from "American Forestry," entitled, "Largest Elm in Connecticut." Since then that maga-

for February or the Stirling Elm described in 'American Forestry' for April. Indeed it is so much larger than either of these two that there apparently is justice in the claim that it is the largest elm in the entire state."



THE BIG ELM AT WETHERSFIELD, CONNECTICUT.
Cut by courtesy of The American Forestry Magazine, Washington, D. C.

zine has published the following, which we are through their courtesy permitted to reprint:

"Mrs. Mary M. Williamson of Middletown, Connecticut, furnishes an addition to the several magnificent elms for which Connecticut is famous, in the Wethersfield Elm which she believes is the largest in the State.

"This elm is at Wethersfield, Hartford County, Connecticut, and when it was measured in 1912 by Mrs. Williamson's husband, its circumference was 27 feet 1 inch, its spread 142 feet 8½ inches and its age about 175 years. This is larger than either the Benedict Elm mentioned in 'American Forestry'

Does the Gray Squirrel Find Buried Nuts by Memory or by Smell?

BY DR. ROBERT T. MORRIS, NEW YORK CITY.

The question relating to this caption has been discussed at considerable length; perhaps both faculties are employed. Here is definite evidence relating to the sense of smell.

On my country place at Stamford, Connecticut, there is a sand beach at the swimming pool. Last winter a large number of acorns of the red oak were whirled into the eddy of this pool and buried in the sand. As the water receded the gray squirrels found these acorns and dug for them at various points near the water's edge.

I was struck by the fact that the squirrels seemed to go directly to each nut; they did not dig about haphazard. In order to experiment a bit I placed a number of the acorns an inch or so beneath the surface of the sand in a row, and the next morning they were all gone.

Wishing to determine the depth at which the squirrels detect the presence of these acorns beneath the surface of wet sand, I buried a row of acorns at a depth of $2\frac{1}{2}$ inches. The following morning it was found that the squirrel which found this row had apparently not been unerring. He had found some of the nuts and left some of the others. This gave the impression that perhaps a limit for him was not far from $2\frac{1}{2}$ inches' depth.

Yesterday morning on going quietly to the pool I saw a gray squirrel industriously digging in the sand near the water's edge. He had scooped out a hole about as big as an ordinary teacup saucer and which was full of water—he kept on digging in the water. When he espied me he ran off. I went to his little pool and scooped out a handful of the sand but there was no nut there. Another handful of sand still more deeply down was taken, with no nut. I then made up my mind that the squirrel had been engaged in some unusual procedure at that particular point, not relating to the question of nuts, but on second thought decided to make a final search. At a depth of nearly six inches three acorns were found lying almost in contact with each other. The squirrel had evidently smelled these acorns through six inches of wet sand before he began digging, and the presence of water in the hole did not change his determination.

There is no doubt but these acorns are somewhat "high." I am enclosing one of them to the editor.

If anyone cares to suggest any particular experiment in this connection, I will try and carry it out, for the acorns and the squirrels will both be at hand.

The Largest Shade Tree.

A sycamore near Worthington, Indiana, has been declared by the American Genetic Association of Washington, D.C., to be the largest shade tree in the United

States. The measurements and other details of interest are given by "The Journal of Heredity" as follows:

"1 ft. above the ground...45 ft. 3 in.

5 ft. above the ground...42 ft. 3 in.

East branch.....27 ft. 8 in.

West branch.....23 ft. 2 in.

"The height is said to have been reduced considerably in recent years by wind and lightning; it is now estimated at 150 feet, while the spread is about 100 feet. As far as is known, these are the largest authentic measurements of a sycamore now living.

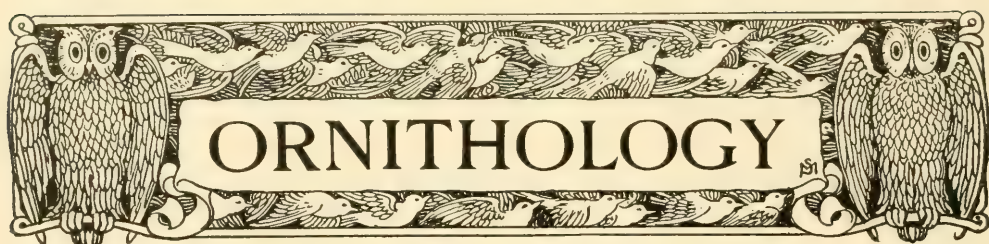
"The American sycamore (*Platanus occidentalis*) is more correctly called the plane tree; it is not related to the Biblical sycamore (*Ficus sycamoris*), a species of fig), mentioned particularly in connection with Zaccheus who, as the old Primer put it, 'did climb a tree, his Lord to see.' The American sycamore is also known in some parts of the country as the buttonwood or buttonball, in allusion to its large seed-balls, which hang on the tree all winter.

"The tree here illustrated is located in the rich alluvial loam of the White River bottom. As this stream frequently overflows its banks, it periodically deposits a layer of silt around the tree; but the floods appear to have done no damage to it, although on one occasion it is said the water reached as high as the fork, 15 feet from the ground. It may be believed that this frequent deposit of alluvium is one of the factors which has caused the great growth of the tree. Many other large sycamores, beech and walnut trees have been produced in the same locality, but most of them have been long since felled for lumber. One of the sycamores which met this fate was so large that it could not be hauled to the mill, but was floated down the river; another, cut in the last few years within 500 yards of 'the big tree,' as the prize winner has been known in the region since the first settlers arrived, made five 10-foot logs, the largest of them 60 inches in diameter and measuring 1,960 board feet. The tap log was about 43 inches in diameter. These figures give some idea of the amount of lumber that a single one of these giants will yield.

"As are most large sycamores, the base of this tree is hollow, the opening being on the opposite side from that shown in the photograph. Fire has recently damaged it."



THIS IS PROBABLY THE LARGEST SHADE TREE NOW STANDING IN THE UNITED STATES.
Cut by courtesy of The American Gardening Association, Washington, D. C.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

Young Bald Eagles.

BY F. J. HAYDEN, VENICE, FLORIDA.

The interesting article in the September number with description of the Great American eagle by the department editor prompts the writer to offer a little supple-

Early in December, 1914, we discovered a new nest on the shore of Dona Bay. It was occupied by a pair of splendid birds which we daily observed circling over the bay in front of our home, robbing gulls, cormorants, pelicans and ospreys with cheerful indiscrimination, carrying the captured fish away to their tree-top nest.

One fine day in January while passing in our launch we saw two young birds standing on the edge of the nest. We were, of course, delighted with the discovery and immediately the edict went forth—we must rival Mr. Higbee's exploit, climb the tree and secure pictures of the young eagles.

The tree was a long leaf pine of stupendous girth and height and the longer we looked at the nest the higher it seemed to be.

Our sole outfit consisted of a ladder, a piece of string and a little Goerz vest-pocket camera. The ladder enabled us to reach the first horizontal limb, my companion insisting on going up with me as a body guard. After half an hour's difficult and laborious climb we reached the bottom of the nest only to find that our troubles had just begun. Over our heads in the top crotch of the tree was a huge mass of seemingly impassable sticks eight feet high by seven feet in diameter. For nearly two hours we studied and worked on the baffling problem of how to get past this huge mass in order to reach the top of the nest. By dint of much patience I finally succeeded in digging sufficient sticks from the nest to give hand hold and footing with which to pull myself up on a limb that overlooked the nest.

During all this time the old birds circled over our heads uttering their peculiar sharp whistles and, although threatening, they did not at any time come near enough for attack.

They were beautiful specimens, their white heads and tails and wonderful expanse of wing showing to splendid advantage directly over our heads.

Upon arriving at the top of the nest



THE NEST WITH THE TWO YOUNG EAGLES. mentary data taken in the same locality one year after Mr. Higbee's visit to our home in Venice, Fla.

my greatest surprise was the size of the young birds. They stood eighteen inches high, were fully feathered and were apparently as large and able to fly as the adults.

Their plumage was a dusty brownish black which is said to undergo three changes before they appear at the close of the third year with white heads and tails. They did not resent my intrusion, in fact the picture shows the utter unconcern with which they regarded both the camera and myself.

One picture shows the birds quite close together. This view gives a very good idea of the hawk-like beak, the marvellous eyes, the beautiful plumage and majestic bearing.

In the next picture the birds were separated with the idea of showing the width and character of the nest and giving some idea of the commanding view from the tree-top nest.

To the north and east the view is an Arabian Night's dream of tropical splendor. To the south (showing in the picture) are the placid waters of beautiful Dona Bay along whose shores stand giant pines and majestic palms hung with flowering ivy and festooned with Spanish moss.

To the west is the roar of the open sea, and probably nowhere on the rim of any ocean is to be found such a wealth of land and water birds. It would be hard to conceive of a location better adapted for the home of the Great American eagle.



A CLOSE VIEW OF THE YOUNG BIRDS.

We are indebted to Mr. Higbee for the first eagles' pictures ever attempted in this locality. At the time he made his perilous climb, with every prospect of being attacked by these powerful birds, it made each particular hair of our heads stand on end until we resembled the fretful porcupine.

Since then a somewhat similar experience has proven to my entire satisfaction that any one looking for adventure (who wishes to be thrilled until their nerves twang like harp strings) will find no sport like hunting eagles with a camera.



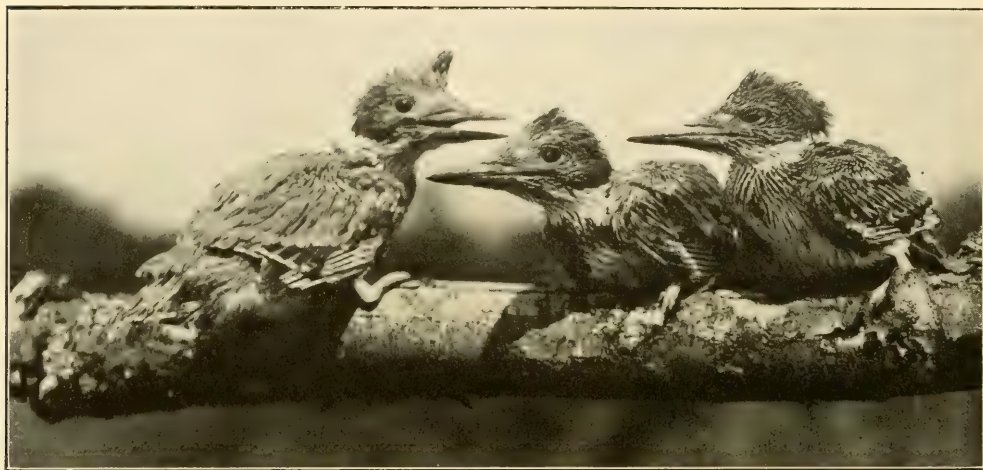
THE AERIE OF THE BALD EAGLE.

The Belted Kingfisher.

BY EDWIN L. JACK, PORTLAND, MAINE.

[Photograph by the Author.]

There are few people, indeed, who are unfamiliar with this Izaak Walton among birds which inhabit the regions of lakes, rivers and streams in the more remote districts of our northern states.



YOUNG KINGFISHERS TWELVE DAYS BEFORE LEAVING THEIR NEST.

As the kingfisher's diet consists entirely of fish,—chiefly chubs, perch and frequently trout,—it is not at all uncommon to come upon him perched motionless on an old dead snag overhanging the water, watching the crystal depths below for his unsuspecting prey. Suddenly, as an unwary fish swims within range of the bird's vision, there is a flash of blue as the kingfisher dives, striking the water with a resounding splash. Immediately he returns to his favorite perch to devour the prize, which if it be a small fish is swallowed head first.

A peculiarity of the kingfisher is the fact that following a meal the bird rejects all indigestible matter, such as bones, fish scales, etc.

Like the bank swallow, this bird places its nest at the end of a tunnel in a bank, which is of clay or gravel and near the water. A pair of kingfishers will sometimes work on an excavation for three weeks before the desired length is attained, tunneling their way into a solid embankment by the use of their strong, sharp bills. At the end of this tunnel, which is usually six feet in length, is an enlarged chamber. Here the female lays from five to seven

glossy white eggs on a little heap of rejected fish bones and scales which in her opinion serves as a nest for the young.

In recent years, especially in the more remote regions, kingfishers have become very numerous and complaints are arising from the fish hatcheries to which the bird frequently finds its way.

I once visited a state hatchery in the interior of Maine, which was situated near a large lake. The men in charge told me they were obliged to shoot over forty kingfishers in less than one month. The birds had discovered that hunting in the shallow pools about the hatchery, which were swarming with trout, was much more easy than waiting by the hour in their natural environments for a meal.

* * * * *

That the kingfisher is a bird worthy of protection in its wild state, is generally acknowledged, as it is known to subsist principally upon fish which are of little or no value as food, but which live upon the eggs and young of other more valuable species. It is therefore to be regretted that it should become necessary to shoot or trap these birds in such instances as above mentioned.

While there is no doubt that the kingfisher at times may do serious damage in destroying young trout, it seems as though ways might be devised for protecting the fish without destroying these birds in any such numbers.

Many hatcheries now have the pools which contain the young trout screened although this is rather expensive.

The Superintendent of the Government Station at Nashua, N. H., writes me that he has a setter dog which has learned to know that the kingfishers are not wanted, and so keeps after them until they are driven away from the ponds. His suggestion that other dogs might be similarly trained is a good one, and seems worthy of a trial in places where these birds are troublesome.—H. G. H.

With the Audubon Societies.

SUMMER COURSES IN BIRD STUDY.

The arrangement made by The National Association of Audubon Societies for conducting summer courses in bird study in New York, Vermont, Virginia, Georgia, South Carolina, Florida, Montana and California seems to have become very popular, and will give to teachers and others a much needed opportunity for a definite, practical course in applied ornithology under the leadership of experts. These courses will doubtless be enlarged and arrangements made to cover many of the other states another season. The Massachusetts Agricultural College has included in its summer classes a four-weeks' course in Bird Life which provides a similar opportunity to all residents of that state.

* * * * *

ILLEGAL SALE OF AIGRETTES.

For the recent seizure of Ten Thousand Dollars' worth of "aigrettes" from five millinery dealers in New York much credit is due the agents of the National Association, who have been untiring in their efforts to bring to justice importers of wild bird plumage in violation of the laws.

The secrecy and underhand methods of handling these "forbidden goods" pursued by the firms mentioned, together with certain facts learned in regard to the collecting of the aigrettes in the Florida rookeries, show that there is still considerable traffic in such goods going on behind our backs, despite the stringent laws enacted to stop this nefarious work.

As long as dealers offer fabulous prices for the aigrettes there will always be plenty of uneducated and unprincipled men ready to defy the laws; collecting the birds even at the risk of their own lives, and finding ways to

ship them undetected, and as long as women demand the aigrettes to wear, so long will unscrupulous dealers continue to offer the fabulous prices to meet their demands. The ceasing of the demand would, of itself, stop the supply.

War Scares Birds Away.

The war is having a great influence on the birds throughout Europe, especially on the birds of passage.

Last Autumn the storks left Russia and Galicia a month earlier than usual: they were noticed in flocks of 30 to 100 on their way through Austria, where they alighted on the roofs and chimneys of the houses, to rest before continuing their journey south.

Other birds of passage have deserted their old routes of flight and have chosen new air roads along less disturbed regions. Both going and returning, these birds were observed in places where they were never seen before, and were missed in the localities where battles were raging.

In Luxemburg, where otherwise millions of birds congregate in leafy forests, there are now scarcely any to be seen or heard.

As an instance how the birds have deserted Luxemburg, a nature lover writes that "whole oat fields have sprung up along the roads and in the market squares of the little towns and villages where the horses have been fed as the cavalry passed through."

This would never have been possible in other years, for then the birds would soon have picked up every grain that fell to the ground.—Scientific American.

Observation on Fall Migration.

BY MRS. F. J. HAYDEN, SIOUX CITY, IOWA.

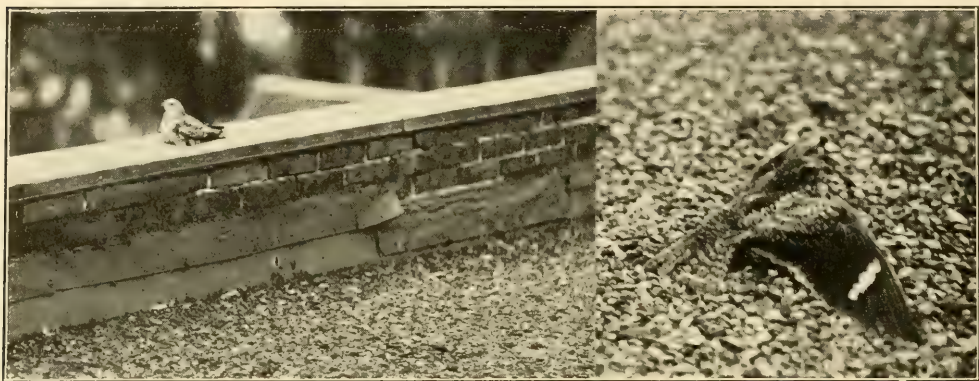
For some reason the migrating warblers, etc., are not in evidence this fall in the vicinity of Sioux City, Ia. It may be that the unusual weather we have had this summer and fall has influenced them to take a different route or to go through by night without stopping.

September 19th we saw a scarlet tanager in the transition stage. The breast was yellow with a few small patches of scarlet. It was silent and shy, seeming to avoid observation as if ashamed of its strange appearance.

Nesting Habits of the Nighthawk

Upon city roofs and house-tops would not generally be supposed a profitable place to look for birds' nests, yet such a location is not uncommonly chosen by

While both young and adult were colored remarkably like the gravel and tar of the roof, the blotched, gray down of the young especially resembled the stones upon which they squatted, and



ADULT NIGHTHAWK ON WALL.

THE FLUTTERING ANTICS OF THE ADULT BIRD.

the nighthawk; perhaps not for its nest, properly speaking,—for there is absolutely no trace of such,—but to deposit its eggs and rear its young.

It was high up on the flat, gravel roof of a business block, along one of the busiest streets of Nashua, N. H., that I first made a visit to such a home on the twenty-sixth of June. As we stepped out from the skylight onto the roof and looked about, there seemed to be nothing visible but the coarse, gravelly floor, enclosed on all sides by a three-foot coping.

It was several minutes before we discovered the parent bird brooding two downy young,—near the end of the roof, under a beam which had been placed across, as a support for a sign. Although in plain sight, they were practically concealed by their remarkable "protective coloring," which was much more apparent in life than the pictures would indicate. The eggs, I learned, had been hatched out in the middle of the roof; the young birds having evidently been transferred to this position for shade.

When within ten or twelve feet, the brooding bird,—which we supposed to be the mother,—fluttered along the roof as if injured, to lure us away from her helpless young. A few yards away she would lie with her wings spread and mouth open, uttering a faint twitter and seemingly unable to fly. When followed she flew to the coping, repeating this performance until closely approached, when she flew off, but soon returned and remained silently watching us.

they were quite invisible a few yards away. They were apparently not many days old and huddled closely together with half-closed eyes.

Four days later we again visited these young, securing several more pictures, and their growth and development in this short period seemed remarkable. They appeared nearly twice their former size and were now covered with pin-feathers. We noticed that the blotched markings extended even to their bills, making their belonging with the surroundings almost perfect. On our approach at this visit, the adult bird, which had been brooding one of the young in the same location as previously, left its charge and repeated its fluttering antics almost at our feet. Curiously enough, our picture of this bird shows a broken, white band near the end of the tail. This is supposed to be a distinguishing mark of the male bird, and would therefore indicate that he shares in the brooding of the young,—a trait which I have been unable to find previously mentioned by any writer. The other young was alone, several yards away, and after photographing them separately the two were placed together as shown in the picture. In neither case, although we made a thorough search, did we see any sign of the other parent bird.

A third visit to this little family, on the tenth of July, disclosed both the young and adult squatted under the shade of the big cross beam, the old bird being between the other two, which were now about two-thirds its size and showing

signs of the mature markings, though still downy in appearance. When I approached within six feet of them both young suddenly flew out, sailing across the roof, up over the casement wall and away, without alighting. The old bird then fluttered out onto the roof, going through its ruse of feigned lameness to distract attention from the young, as before.

The nighthawk, or "bull-bat," is without doubt one of the most useful of all birds to the farmer and agriculturist, as it feeds entirely upon insects, of which it destroys large quantities. Stomachs of these birds examined have been found to contain over five hundred mosquitos; others even a greater number of flying ants, while grass-hoppers, cucumber beetles, potato beetles, cotton-boll weevils, June-bugs and various other destructive insects form part of their daily food. These insects are all captured by the birds while on the wing. They are very adept fliers, with a quick zigzagging flight, and as they come forth about dusk they may often be seen making great swoops downward through the air, seemingly as if they would dash into the ground or the top of some building, suddenly swerving just before they strike.

On a wall or ridge of a house they usually alight length-wise,—instead of cross-wise, as do most of the perching birds,—and it is in this position, squatted upon the limb of a tree, that the nighthawk spends the day in the woods. Here in some open spot it deposits its two eggs—which are blotched similar to the young birds—either upon the ground or a bare rock.

Chapman, in his "Handbook of Birds of Eastern N. A.," states that "the nighthawk is one of our few truly nocturnal birds," while Forbush, in his "Useful Birds and their Protection," remarks that "It flies chiefly at evening but is seldom heard to cry after dark, and often may be seen flying about during the greater part of the day." My own experience bears out the latter statement, and I have frequently heard this bird's sharp, wheezy note in the middle of the day and looked up to see them flying about, high above the city buildings,—although their favorite time for feeding seems to be from sunset until dark, and in the early hours of the morning. The note of these interesting birds, although difficult to describe, is unlike that made by any other, and when once heard will be remembered.

Belonging to the order of goatsuckers, swifts and humming-birds, the nighthawk is of the same family as the whip-poor-will, which it somewhat resembles and with which it seems to be often confounded. The latter, however, has a *rounded* tail showing broad white patches on its outer feathers, and short, rounded wings with no conspicuous markings; while the former has long, angular wings with prominent white bars, and a slightly *forked* tail. The difference in plumage markings is also readily apparent upon a close examination and comparison. The whip-poor-will is a bird of the woods, often heard, but rarely seen,—unless occasionally it is flushed from the ground, where it spends the day,—as it seldom appears before night-fall.

Nighthawks are birds of the open and



"THEY WERE QUITE INVISIBLE A FEW YARDS AWAY."

"THE BLOTCHED MARKINGS EXTENDED EVEN TO THEIR BILLS."

one has frequent opportunities to observe them about their haunts. They range over the greater part of North America, appearing in the latitude of New York about the first of May, and leaving about the first of September. They winter south to Argentina.

Robin Roosts.

BY F. J. HAYDEN, SIOUX CITY, IOWA.

Autumnal ornithology brings many interesting problems. The remarkable habit of robins roosting together in large flocks beginning in July and lasting until migration seems to receive no comment or attempted explanation in our popular bird books.

At the Sioux City Morningside College campus is a robins' roost toward which every evening these birds may be seen flying from all directions over the city. Upon arriving at the grounds a few evenings ago at 5.30 P.M. only a few robins were in evidence. Soon however we observed them coming in twos and threes and dozens from all directions.

It was out of the question to keep count or make sure of them all but judging that the influx was equally great on all sides there must have been between one and two thousand birds. The trees were soon filled with a loud cackling, scores were bathing in roadside pools and the ground and grass seemed literally alive with robins.

By day these birds scatter over the entire city and country. They make no attempt to live in communities in the summer but any one who will keep a sharp lookout on the robins in their locality will find that beginning in July and August these birds flock to some general roosting place at sunset.

It would hardly seem that this gathering could be in any way connected with the southern migration. Why then should these birds not sleep upon their respective nesting and feeding grounds instead of flying several miles twice a day just for the privilege of spending the nights at some particular rendezvous?

* * * * *

[Have any of our readers noticed similar roosts in their localities?—H. G. H.]

O Mountains, lift us to your heights,

Let us look down, serene,

O on all the pettiness of life,

Which distance serves to screen.

—Emma Peirce.

The Junior Audubon Work.

AUDUBON SOCIETY OF NEW HAMPSHIRE.
BY THE REV. MANLEY B. TOWNSEND, SEC.

"The child is father to the man." The rising generation of today are to carry on the world's work tomorrow. Any effective educational work must comprehend the children. The National Association of Audubon Societies, realizing this and wishing to do something big for bird conservation and the spread of knowledge about our feathered songsters, four years ago began in a modest way the organization of Junior Audubon Classes in the public schools. It was a master stroke. Everywhere, from Maine to California, teachers and children seized upon the idea with enthusiasm.

A good friend of the children and the birds contributed five thousand dollars for the work. The next year he gave seven thousand, and last year he increased the sum to twenty thousand dollars! Such is his confidence in this method. This year he has repeated his gift, and has placed another twenty thousand dollars at the disposal of the Association.

Every child who pays ten cents and joins a Junior Audubon Class receives ten bird leaflets (all different): ten colored plates and ten outline drawings, besides a bird button,—the Junior Audubon badge. Every teacher organizing a class of ten or more receives "Bird-Lore" free. Educators everywhere endorse the plan and are ready to help the work. Six years ago Mrs. Russell Sage gave five thousand dollars for similar work in the South, and has maintained her generous gift yearly. Without these gifts the work could not be continued. The fees received from the children are merely nominal.

The results of this work have been truly astonishing. From its humble beginning six years ago to the present day, the total enrollment has grown from ten thousand enrolled in one year to one hundred and fifty thousand enrolled in 1914-15. One hundred and fifty thousand children studying birds, learning to make bird-houses, bird-baths and to attract birds about the house! One hundred and fifty thousand children educated in bird conservation, their eyes opened to one of the most fascinat-

ing of nature's realms! Nor does the good work end with the children, for every one of them carries home the knowledge he has gained and educates his father and mother and the other members of the family. So there is no measuring the good that this work is accomplishing. "A little child shall lead them."

Bulletins of Interest to Bird Students.

The following bulletins may be obtained free while the supply lasts from the Editor and Chief, Division of Publications, and after that at a nominal cost from the Superintendent of Documents, U. S. Dept. of Agriculture, Washington, D. C.

There are constantly new bulletins of this nature appearing from this department, as well as from the various State Boards of Agriculture, and bird students would do well to keep in touch with them, as nowhere else may so much valuable information be obtained at so slight a cost.

DEPARTMENT BULLETINS.

- No. 107. Birds in relation to the alfalfa weevil.
- No. 128. Distribution and migration N. A. rails and their allies.
- No. 187. Preliminary census of birds of the U. S.

FARMERS' BULLETINS.

- No. 197. Importation of game birds and eggs for propagation.
- No. 390. Pheasant raising in the U. S.
- No. 456. Our grosbeaks and their value to agriculture.
- No. 493. The English sparrow as a pest.
- No. 497. Some common game, aquatic and rapacious birds in relation to man.
- No. 506. Food of some well-known birds of forest, farm and garden.
- No. 513. Fifty common birds of farm and orchard.
- No. 609. Bird houses and how to build them.
- No. 621. How to attract birds in north-eastern U. S.
- No. 630. Some common birds useful to the farmer.

CIRCULARS.

- No. 17. Biological Survey. Bird day in the schools.
- No. 71. Biological survey, National bird and mammal reservations in Alaska.
- No. 79. Biological Survey, Our vanishing shore-birds.
- No. 81. Biological Survey, Three impor-

tant wild duck foods.

- No. 84. Biological Survey, Distribution of the American egrets.
- No. 87. Biological Survey, National reservations for the protection of wild life.

Y. B. SEPARATES.

- 504. Plants useful to attract birds and protect fruit.
- 590. Our meadowlarks in relation to agriculture.
- 601. Relation of birds to grain aphides.
- 620. The American thrushes valuable bird neighbors.
- 642. Our shore-birds and their future.
- Reprint Year-book 1904, The relation of birds to fruit growing in California
- Biological Survey, Bulletin 44, Food of our more important flycatchers.

The cause of bird protection spreads. With the beginning of this year, importation of wild bird plumage was prohibited for the entire Dominion of Canada. Now comes the report that the law is on against shooting and exporting skins even in such unlikely places as Java and New Guinea. To be sure, this latter prohibition affects only some districts and some species of birds of paradise; but prospects are said to be bright for further extensions.

To Frederick Ward Putnam, head of the Peabody Museum at Harvard, who died last August at the age of seventy-six, is assigned the credit of inaugurating the modern type of scientific collecting expedition. Before his time, expeditions went out in search of whatever they could pick up. Nowadays, they start out with a particular problem to solve and bring back to the museum the evidence for the answer.

Readers of Dr. W. J. Holland's well-known "Butterfly Book," one of the most fresh and charming of all natural history volumes, will welcome his "Butterfly Guide." The new work, unlike the old, is distinctly a "guide book," a vast pocket manual for the identification of 255 common species, largely by means of some three hundred remarkably well executed colored pictures. Yet the price is only one dollar.

The Cardinal.

A flash of color, a burst of song,
A cardinal has passed along.

—Emma Peirce.

TO KNOW THE STARRY HEAVENS

The Heavens in November.

BY PROF. ERIC DOOLITTLE, OF THE UNIVERSITY OF PENNSYLVANIA.

With the approach of winter the eastern heavens are beginning to be filled with the most brilliant constellations of the entire sky. Already the most beautiful and striking group of the Bull, with the lesser groups of the Pleiades and the Hyades which are in-

Saturn into our evening sky, so that throughout November both Saturn and Jupiter, which are the most satisfactory planets of all for study with a small telescope, will remain with us in excellent position for observation.

This month also is the month of the most interesting November shooting stars, the richest in numbers of all the shooting star showers of the year, and

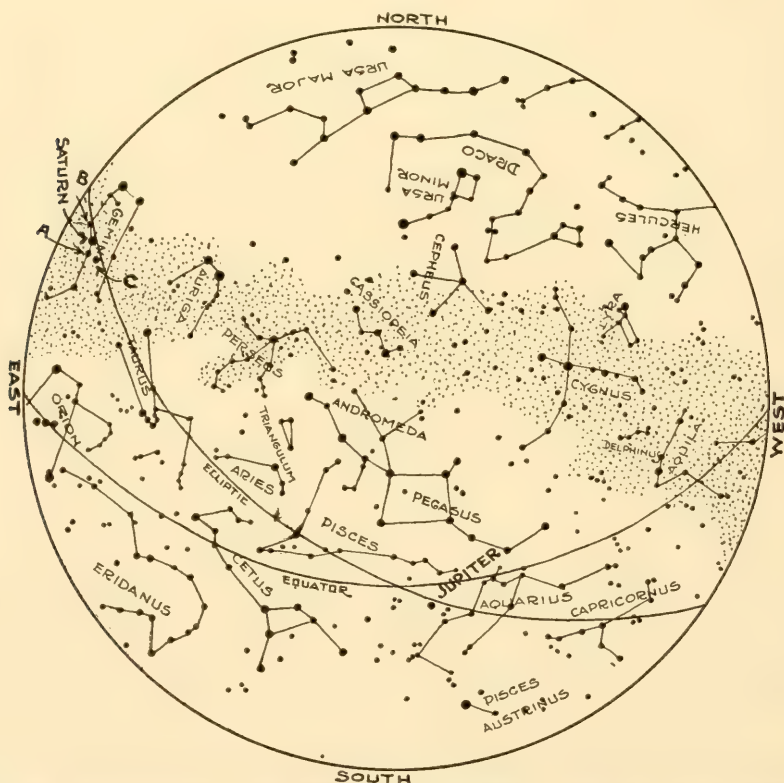


Fig. 1. The Constellations at 9 P. M., November 1. (If facing South, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

involved in it, has risen high above the eastern ground, while below this there shines out the very brilliant Gemini and the great constellation of Orion, which is the most striking star group of the entire heavens.

The present month is signalized also by the entrance of the beautiful planet

when we add that we are at this moment very near to the time when the spots upon our sun appear in their greatest number it will be realized that the present month is one of unusual interest to those who find pleasure in watching and studying the revelations of the sky.

How to Observe the Sun With a Small Telescope.

During the last several weeks the reader may have noticed occasional newspaper announcements of the dis-

destroy the eyesight. Sometimes a dark paper is placed over the larger lens, having a small circular hole cut from its center, but this is a poor plan, for it greatly increases the blurring of

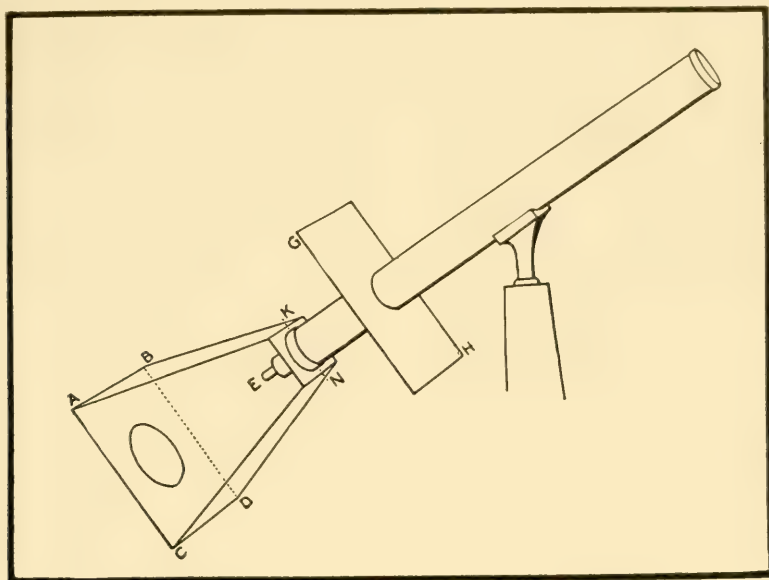


Fig. 2. Arrangement for viewing the sun with a small telescope.

covery of one or more great sun spots, the discovery being sometimes credited to one astronomer and sometimes to another. As a matter of fact, any sun spot large enough to be noteworthy is visible even in the smallest telescope, and sometimes even without any telescope at all, and therefore it will be sure to at once be seen by any observer who happens to look at the sun's disc after it has appeared. It is thus hardly more reasonable to speak of the "discoverer" of a great sun spot than to credit a single observer with the discovery of a full moon or of an equinoctial storm. At the present time, and for several months to come, every possessor of a small telescope will find that a frequent examination of the sun's disc will afford a most profitable and interesting study. For we are now very near to an epoch of sun-spot maximum, an epoch which will not occur again until 11 years from the present time.

With even a small telescope one cannot look directly at the sun, for were this done the large lens would act as a burning glass and concentrate upon the eye all of the light and heat rays which fall upon the area of its surface. This would injure or even completely

the solar image. A far better arrangement is that shown in Figure 2. The eyepiece at E is removed and the card-board screen A. D. is adjusted at the position of most perfect focus, a clear image of the sun will appear upon the screen, especially if a dark cloth be thrown over the top and farther sides, ABKD, so as to cut off all outside light. (The figure is taken from Kelvin McKready's "A Beginner's Star Book.")

The amateur should be warned against looking at the sun directly, even with the red glasses provided with small telescopes. If the observation is prolonged, which is apt to be the case when an enthusiastic observer is intently watching the marvelous changes going on in this wonderful star, the heat may suddenly crack the red cover with disastrous results to the observer's eyesight.

* * * * *

The Sun a Great Ball of Fire.

When care is used in arranging this simple apparatus an image of the sun will appear on the screen which will have all the sharpness and clearness of a steel engraving, its appearance resembling more or less that shown in

Figure 3. The observer will at the present time see several spots upon its surface, and if he will look at these at intervals of a few days he will plainly see that our great luminary is steadily turning around upon its axis, just as the earth is doing. But our great sun, a million times larger than our earth, instead of turning about once each day,

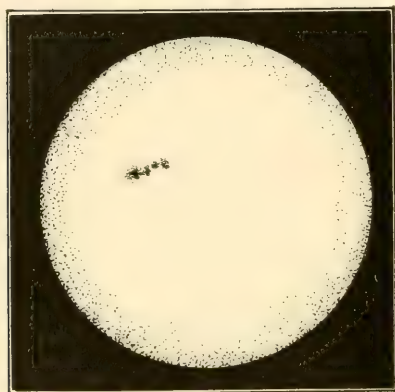


Fig. 3. The appearance of the sun as viewed in a small telescope.

occupies twenty-five and one-third days in making one single rotation. If, therefore, the observer sees a large spot just coming around the advancing edge—that is, just rising to his view—nearly two weeks will elapse before its steady onward motion will have carried it entirely across the disc of the sun and caused it to withdraw from view to the side of the sun which is ever hidden from us.

Our sun is an inconceivably large body, no less than 866,500 miles in diameter, and it is so excessively hot that the temperature, even of its cooler outer layer, is no less than 12,000 degrees above zero. This is sufficient not only to melt but to instantly vaporize any known substance which occurs upon the earth. Consequently we believe that the sun is nothing but a great ball of intensely heated, gaseous matter. How inconceivably hot its interior may be we have no means of ascertaining, but doubtless great currents of superheated matter are forever rushing from the interior to the surface and, becoming cooled there, are sinking to the interior again—currents of vaporized metals and other substances on which whole earths like ours would be carried as easily as small chips are carried upon the surface of a swiftly flowing mill stream.

The whole enormous ball is in a state of inconceivably violent agitation. It is no wonder that great disturbances appear upon its surface, known to us as sun spots, and that these are sometimes of forty or even fifty thousand miles in diameter. We do not know their exact nature, nor do we know why, every 11 years, they reappear in very unusual numbers. But long-continued observations have shown that the inconceivably violent agitations to which this great ball is subjected attain their maximum regularly at times separated by this constant interval. It is certain that these disturbances will thus be the greatest from toward the end of the present year until nearly the middle of 1916. It is during these months that our sun will be an object of the highest interest for study to those who are so fortunate as to have access to a small telescope.

* * * * *

The Planets in November.

Mercury, which passed to the west of the sun and became a morning star on October 22, will reach its greatest western elongation on November 7, and at this time may be seen in the early dawn for nearly two hours before sunrise. It must be looked for very near the ground, a little south of the east point, where it will be seen shining with three times the brightness of a standard first-magnitude star. In the telescope during the last days of October it will appear as a beautiful, thin, silvery crescent, becoming half full on November 7, and from then on rapidly increasing its phase.

Venus is destined soon to be the most conspicuous object of the evening skies, but it is still too near the sun to be easily observed. On November 1 it sets but 50 minutes after sunset, and this time is increased to only 1 hour and 10 minutes by November 30. The planet is now moving very rapidly southward over the sky and by the latter date is almost 25 degrees below the equator. Soon after the end of the month, however, it will begin to move rapidly northward and will thus soon be seen high in the evening sky. At present it must be looked for far south of the west point of the horizon, shining in the twilight for about an hour after the sun has set.

Mars, though destined soon to enter the borders of our evening star map, is still a little too far east to be shown in Figure 1. During November it moves from Cancer well into the constellation Leo. On November 1 it is a little above and to the east of the remarkable cluster of stars known as the Praesepe, while by November 30 it has reached a position only slightly to the right of Regulus. On the former date it rises about 10 o'clock, and on the latter half an hour earlier. This planet is still drawing steadily nearer to us, its distance decreasing during the present month from 122 to 99 millions of miles. It will not, however, be in its best position for observation and become a striking object in the evening heavens until next spring.

Jupiter, which is seen shining brilliantly in the south, a little to the west of the meridian, is now the most beautiful and conspicuous object in the evening sky. This planet is always a most satisfying object for examination in a small telescope. If the air is reasonably steady its beautiful rose-colored bands and its four bright moons can always be seen, and if the observer has the patience to watch this world for only a few hours he can see clearly that it is turning around under his telescope. In fact, any marking which is seen emerging at the right-hand edge of the planet will pass completely across the disc and disappear at the left-hand edge in less than five hours; and, meanwhile, the bright moons will be seen to be rapidly changing their positions, some transiting across the planet's disc, some passing behind it and some passing into the planet's shadow and becoming eclipsed, so that altogether the wonderful system affords perhaps the best study in a small telescope of any object in the entire heavens. Eclipses, etc., of the moons will be seen to occur in unusual numbers on the evenings of November 2, 9, 22 and 27.

The beautiful planet Saturn will be seen in almost the center of the constellation Gemini, a short distance up from the east point of the horizon in the early evening and by midnight it will have risen high in the heavens. The rings of this planet are now widely opened and it forms a beautiful object in a small telescope. The planet is now

between the bright stars A and B of Figure 1. It is at present retrograding, or moving westward over the sky, and will pass the star at A on December 27. This westward motion of Saturn will continue until March 11, when it will have reached the position C. After this it will run rapidly eastward, not, however, finally passing the star at B until June 21. The eastward motion of Saturn carries it entirely around the sphere in about 30 years, but in the course of this motion it retrogrades no less than 29 times, so that its actual path among the stars is a very complicated one.

* * * * *

The November Shooting Stars.

If the observer will go out of doors toward midnight about the middle of the month and face northeast he will see an occasional shooting star dart outward from the constellation Leo, move very swiftly across the sky and disappear. These are the November shooting stars. Each one is a little meteoric body which is moving with a high velocity about the sun and which, colliding with the upper regions of our air, is rendered luminous and speedily consumed by the great friction to which it is subjected. The earth happens to run into this stream of particles, consequently they plow through our air with a speed of about 40 miles a second and are hence very quickly consumed. The stream of August meteors on the contrary overtake the earth, and therefore enter our air with a velocity of only about eight miles a second; these shooting stars are hence consumed but slowly, and travel in long paths across the sky. For these reasons also the light of the November meteors is of a deep bluish color, while that of the August meteors is yellowish or red. The former meteoric swarm is following about the sun the exact path of a comet known as Tempel's Comet: it is indeed believed to be nothing less than the remains of this comet, which has been drawn out along its orbit for a great distance owing to the tidal action of the sun. Each year in November our earth runs into this swarm of meteoric particles and there results what we observe as the November shower of shooting stars.

No star seemed less than what science has taught us that it is.—Cooper.

An Interesting "Ten" at the Sound Beach Observatory.

1. The Moon. This is generally regarded as the most spectacular object in the sky. The new telescope may be used to advantage along about the first quarter of the moon, perhaps a few days before or a few days after. Then may be clearly seen the mighty Apennines—a long mountain range, the huge volcanoes—Copernicus and Gassendi, the streaks radiating from Tycho, and other spectacular appearances. A view of the moon is impressive to most persons because it shows that the familiar object has not been known as it really is. The six inch telescope shows all of the more prominent details with probably fully as much satisfaction to the amateur astronomer as does any other telescope in the United States. This is true of nearly all the most interesting objects. A popular but erroneous impression is that huge telescopes and big buildings are required for observation. These huge equipments are used mostly in technical research, especially in photography. When the moon is shining in the sky, it is not only in itself an interesting object, but it overpowers everything else and monopolizes our attention. On moonlight nights we see the moon but on moonless nights we may readily see all the other nine objects here listed.

2. Jupiter. This may now be viewed at its best in the southern sky. Even the naked eye is attracted by its marvelous splendor. It is larger than all the other planets put together; it is thirteen hundred times as large as the earth. Most astronomers agree that nothing in the heavens is more impressive than the disappearance and the return of Jupiter's moons. The planet and its wonderful train of circling satellites that gleam like diamond sparks cannot be adequately described in words; they can be appreciated only when seen. Both the moons and the planet can easily be seen to be moving in a small telescope. Jupiter actually turns around under the telescope as one looks at it—an interesting sight.

3. Hercules 13M Star Cluster. On a still moonless evening the sight of this sun cluster in Hercules captivates the mind of even the most thoughtless and uncontemplative observer. Here the

imagination will unavoidably let itself loose on its wings and fly away to that wonderful collection of suns which was estimated by Sir William Herschel to contain fourteen thousand stars, and in which at the great observatory on Mount Wilson sixty thousand were counted, but whose true number may even be far more. It can be seen even with an opera glass as a small nebulous body between Eta and Beta Herculis. It is one of the few objects that a large telescope will exhibit to a little better advantage than will one of six inches' aperture, but the difference is not great. It would probably not be noticeable to any but the professional astronomer. The spectacular appearance in the six inch is surely fully up to the wonders of this far famed cluster which is practically unknown to those that are not especially interested in astronomy. I once spent an evening in a large observatory and had the big telescope placed at my disposal. "What are you going to try it on?" asked the astronomer. "Try it on! I intend to travel in 13M. That is a dreamland I long have wanted to see." For more than an hour I gazed at those myriad suns, first with one eye, then with the other, first with one eyepiece and then with another. I could not tire of looking. It is marvelous. It is more. It is awe-inspiring.

4. Andromeda Nebula. This great nebula, famous in itself, is easily distinguishable with a good opera glass; indeed, a person with acute eyesight may on a very clear and cloudless evening see it as a nebulous body, but it does not usually attract much public attention. In August, 1885, a new star suddenly made its appearance in this nebula, but in a year it disappeared. Not even the largest telescope in the United States can now find it. This astonishing phenomenon gives one the same feeling as looking at a so-called haunted house only in this case the mysterious appearance and disappearance are proven beyond the shadow of a doubt. Where did that star come from? Where did it go? No human being in all this world can answer these questions.

5. Epsilon Lyrae. This is near Vega, the third brightest star in the sky and the brightest north of the celestial equator. It emits one hundred times more light than our sun. Epsilon Lyrae

is a fourth magnitude star but on account of its intrinsic interest even out-rivals Vega, the third brightest star of the sky. With it and with one other star it forms a small equal-sided triangle. It is not only a good example of a double but of a double double. Even with the unaided eye, if acute, it may be seen as a double star. A small opera glass readily separates the two doubles, but the six inch at the Sound Beach Observatory shows not only the double but splits each component, making a double double. Between the two components appear two faint spots of light that Sir John Herschel made famous by naming *debilissima*. If we may call the new star in Andromeda, The Ghost, then we may call this The Will-o'-the-Wisp, because now you see it and now you don't. It demands careful scrutiny with the most sensitive part of the retina. About ten degrees east of Vega, within this constellation, appears the famous Ring Nebula of Lyra. This is considered by some to be as interesting as the Andromeda Nebula.

6. The famous colored star, Albireo. This is Beta Cygni and if one thinks of the beautiful constellation in the Milky Way as a swan flying southward, then this is the bill of the swan. If one thinks of it, as is commonly done, as a cross, then Albireo is to be regarded as the base of a cross leaning toward the north. Perhaps this is the most charming of all double stars. During November a number of beautiful colored stars will be easily accessible. For those that best like these objects a list of some half dozen will be provided. The components of Albireo are in sharp and beautiful contrast—light yellow and deep blue. It is a heavenly sight unknown to one that has not used a telescope, and to which one may return again and again with pleasure undiminished.

7. Algol, the Demon Star. Every starlover should be able to locate Algol, and to follow the perfect and regular changes that occur at intervals of two days, twenty hours, forty-eight minutes and fifty-five seconds; that is, they occur on every third day about three hours and eleven minutes earlier in the day than at the previous maximum or minimum. Perhaps there is no other variable about which so many popular

articles have been written. The story is as fascinating as any that can be told. Algol is supposed to have a dark component about the size of our sun and slightly smaller than Algol itself; it does not totally eclipse Algol, but as it revolves around the star gradually, and regularly every three days, reduces its light from the second to the fourth magnitude. Can anything be more fascinating than a black sun that circles around a bright star but never completely hides it?

8. The Milky Way or The Galaxy. The telescope shows that here, spinning together, are unknown millions of stars, with others as numerous that the most powerful telescopes can only faintly define. Our six inch telescope is turned on various parts of this amazing collection of suns, suns as plentiful as are the sands of the sea, and shows their segregation, or collection, into little groups, and among them, here and there, amidst this streaming of dust-like suns, jet black, apparently empty holes, places where one might say, in popular language, "The bottom of everything has fallen out," and through them we gaze into vacant space.

9. Mizar. This is the big bear's principal attraction. Even the naked eye shows near it a small star named Alcor, but the telescope will apparently cut Mizar in two and show that it consists of two bright stars brilliantly contrasting in color, the larger white, the smaller blue green. These two with Alcor form an interesting triangle. Besides Alcor several fainter stars are seen clustered together over the field of view. "Taken all in all," says Mr. Serviss, "there are very few equally beautiful sights in the starry heavens." Near-by are several interesting nebulae.

10. The Pivot of the Top. All the stars and other objects that have been mentioned move rapidly out of the field of the telescope, showing that the earth is whirling rapidly in space, literally spinning like a top, and carrying the telescope with it. The telescope will be turned on Polaris, the pole star, that is interesting not only in itself but in the fact that it is the pivot around which all the others are turning. The pole star is not exactly the pivot, but is so near that for practical purposes it stands still like the pivot of a spinning top, and will remain long in the field of

the telescope, while for all other stars a constant adjustment is needed to keep the object in sight. Polaris is a double separable by even a small telescope. The six inch clearly shows it as a double.

Appointments to view the heavens through the telescope on clear evenings should be made by telephone, so as to prevent overcrowding in the small (twelve by twelve) observatory. Those that wish to study popular astronomy systematically may arrange now for a series of absolutely free lessons.

Contributions to the Sound Beach Observatory.

Mrs. M. Kennerley, Mamaroneck, N. Y.,	\$ 10.00
Greenwich Farmers' Club, Greenwich	5.00
Mr. George Lauder, Jr., Greenwich (Increase—total \$50.00)..	25.00
A Friend, Stamford (Increase—total \$13.00)	10.00
A Friend, Sound Beach.....	10.00
R. Hertzberg, M.D., Stamford..	5.00
Mrs. Pauline Agassiz Shaw, Jamaica Plains, Mass.....	50.00
Judge Charles D. Lockwood, Stamford	5.00
A Friend, Stamford.....	5.00
Lewis W. Barney, Ph.D., Sound Beach	5.00
Miss May L. Johnson, Morris Park, N. Y.....	.50
Miss Elizabeth D. Ferguson, Stamford	20.00
Mr. Stephen I. Clason, Sound Beach	1.00
Mr. R. L. Agassiz, Boston, Mass.,	20.00
Mr. Howard H. Cleaves, New Brighton, N. Y.....	3.00
Total	\$174.50
Previously acknowledged	\$758.08
Grand Total	\$932.58
* * * * *	

Mrs. Pauline Agassiz Shaw is the daughter of Louis Agassiz from whom The Agassiz Association is named. In sending her contribution, she writes as follows:

"I enclose with pleasure \$50 for your telescope and congratulate you on the purchase of Clark's wonderful instrument which I well know. I am sorry I cannot send more.

"I think your family of students will have some wonderful revelations by means of this telescope."

* * * * *

Mr. Howard H. Cleaves writes us:

"You may thank the quartz-like clearness of the sky last night for the inclosure, which is for the Observatory Fund.

"My bed is so near the window that I can thrust my head out into the open the second I hear a screech owl, or the notes of any migratory birds. This I did last night and after the bird sounds had ceased I fell to gazing at the stars and wondering about them. The twinkling of the stars reminded me of the radiant optimism of the Sage of Sound Beach—and from this it was perhaps only a natural sequence of meditation that led me to recall the need of funds for the Observatory!

"It isn't always that one's night thoughts are found to be substantial the next morning; but in this instance my faith has boldly held until I have reached my check-book."

Trained Aircraft Guns on Jupiter.

Paris.—Jupiter, looming up especially brilliant nowadays, has been frequently mistaken for the searchlight of an aeroplane flying over Paris. Gunners at the front have made the same mistake, and prepared to train their anti-aircraft weapons against it. The well known astronomer, Abbe Moreaux, says he has received a great many letters from them asking particulars about this great light in the East, brought to their notice for the first time by the war. Abbe Moreux infers from the mass of correspondence received that thousands of soldiers obliged to pass the night under the open sky, are acquiring an interest in the wonders and beauties of nature that otherwise they would have passed their lives without.—Newspaper.

Purple and Gold.

The first flower colors are purple and gold,
Behold when crocus buds unfold..
And when the season's latest blooms
Unfurl their brilliant, wayside plumes,
Are purple and gold again abroad,
In aster rays, and golden-rod:
While linking the two year around,
Are sunset clouds, gold-purple crowned.
—Emma Peirce.



PUBLISHER'S NOTICES

Tis not in mortals to COMMAND success, but we'll do more, Sempronius, we'll DESERVE IT.
—Addison: Cato

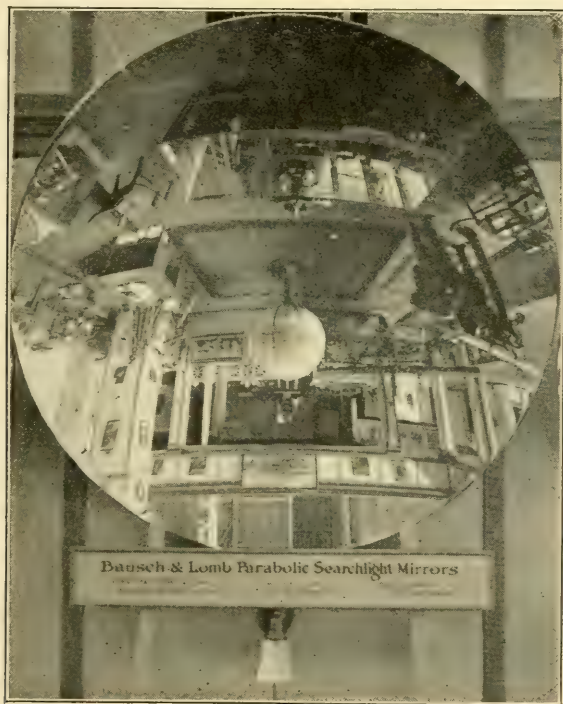
Awards for Optical Excellence.

The record made by the Bausch & Lomb Optical Co. at the Panama-Pacific Exposition is one that is probably unequalled by any of the other exhibitors at San Francisco. The awards granted aggregate four Grand Prix, or highest possible awards, one Medal of Honor and one Gold Medal. The award

received one Grand Prix and in most cases only a Gold Medal.

The four classes in which Bausch & Lomb Optical Co. received the Grand Prix are Optical Instruments, Balopticons, Engineering Instruments and Range Finders. The first division, called Optical Instruments, is comprised of seven classes and covers the company's Ophthalmic Lenses, microscopes, parabolic and Mangin mirrors, Field Glasses, microtomes and magnifiers.

Ophthalmic lenses, or the lenses used in eyeglasses and spectacles, are one of the chief products of the Bausch & Lomb plant and many million pairs per year are manufactured. Notwithstanding this quantity production, the highest standard of scientific accuracy and precision is maintained and every single lens is subjected to rigid inspections before leaving the factory. Within the past year Bausch & Lomb have introduced in America two new types of lenses invented by their associates, the Carl Zeiss Works. One of these is the Punktal, which is described as a perfectly corrected ophthalmic lens and which is rapidly coming into favor in preference to the ordinary spectacle lenses heretofore used.



THE WONDERFUL MIRRORS.

in each case was the highest prize granted. There is good reason to believe that no one company in any other department of the great Exposition received such high honors as did Bausch & Lomb. In fact the company's representative at the Fair writes that the other exhibitors, regardless of their product or how they were grouped only

The second type is the Katral, a lens which restores nearly normal vision to persons who have been operated upon for cataract. The Punktal and Katral lenses are acclaimed by scientists as the greatest achievement thus far attained in this branch of optics.

The superior quality of all Bausch & Lomb optical instruments is gener-

ally recognized. Their microscopes are found in the laboratories, schools and colleges throughout the country. Magnifiers of this make have been in use for sixty years, while it was this company who introduced in this country the stereoscopic prism field glass, a type that is now universally adopted for the better quality glasses.

Another Grand Prize was awarded the Balopticons, as the projection apparatus of Bausch & Lomb manufacture is called. It is believed that this award was granted not only on the general excellence and completeness of this line, but upon the marked improvement in projection apparatus caused by the entry of this company into the field. Besides simple stereopticons for lantern slide projection, the Balopticons include instruments which project opaque objects direct, that is, solid objects or actual photographs, pictures, etc., without the necessity of making lantern slides. These instruments also project on the screen objects as seen through the microscope and include every other device known in optical projection.

Bausch & Lomb surveying instruments received a Grand Prix for "General Design and Excellence of Quality." These engineering instruments are known to engineers everywhere for the excellence of their optical parts and the number and value of the mechanical improvements which these instruments introduced as innovations in the field.

The fourth Grand Prize awarded Bausch & Lomb products was granted upon Range Finders. These instruments are used in all branches of warfare to ascertain the distance of a hostile ship or force, and thus obtain the firing range. As used in connection with the big guns of the Coast Defense, the range finders may be stationed a mile away from the enemy's guns and find the range of the approaching ships, the various factors are calculated and the position of the enemy plotted on a chart. Exact directions are telephoned to the officer in charge of the firing squad, who may never see what they are shooting at.

The optical parts of the Bausch &

Lomb range finders are mounted in a way original with this make. They are suspended upon nickel-steel wires stretched between the ends of the tube under a tension of 10,000 pounds. Bausch & Lomb are now making two of the largest instruments ever built. They are forty feet in length and will be used in the fortifications on the Panama Canal.

When, in the early days of photography, Bausch & Lomb began to manufacture photographic lenses they produced them so cheaply that camera manufacturers were enabled to offer their products at popular prices. The invention of the iris diaphragm shutter helped still further in making picture-taking popular and paved the way for the modern high-speed lens. Hence, when Dr. Rudolph, of the Zeiss Works, invented the modern anastigmat photographic lens, the Zeiss company now collaborators of the Bausch & Lomb Optical Co., designated these manufacturers as the sole producers for America. As a result of the experience and skill gained in this way, the Gold Medal has been awarded to Bausch & Lomb-Zeiss photographic lenses.

The Photomicrographic Apparatus of Bausch & Lomb make has been granted the Medal of Honor. This apparatus consists of a special camera with appliances for using it in connection with a microscope to make photographs of specimens as seen in the microscope. Considerable accuracy and rigidity are required in the mechanical parts and high quality in the optics—for the image as received on the photographic plate is magnified a thousand or more times and the slightest tremor of the apparatus or other defect would result in a failure.

Minerals for Working Collections.

Ward's Natural Science Establishment, 84-102 College Avenue, Rochester, New York, has recently issued an attractive pamphlet that gives a list of their minerals and prices. It contains many suggestions in regard to a selection for private cabinets and for school use. We advise our readers that are interested in minerals to send for this pamphlet with a mention of *THE GUIDE TO NATURE*.

The Guide To Nature



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ARCADIA: SOUND BEACH, CONNECTICUT
EDWARD F. BIGELOW, Managing Editor

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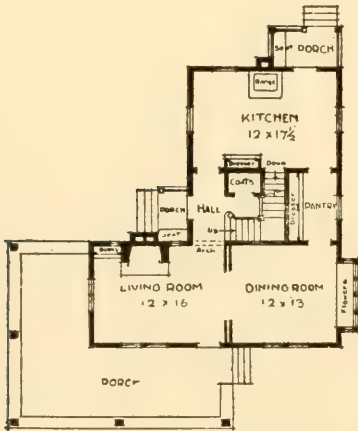
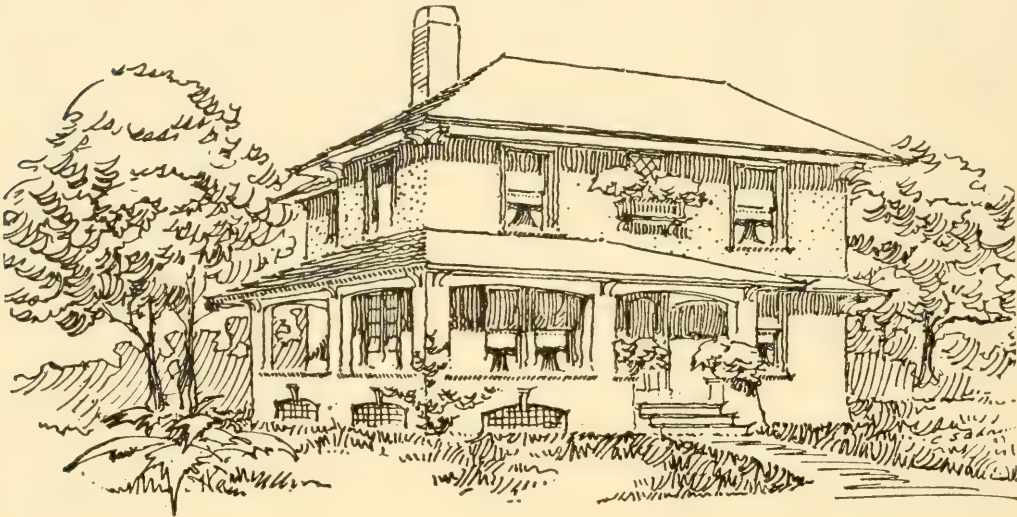
A Home Near to Nature

This design is of a popular style, beautiful in appearance with many little points of taste and convenience. It has a living room with open fireplace and wide doorway to dining room. Hall contains pretty staircase with coat closet under it. The kitchen is a very large and convenient one. Pantry contains dresser.

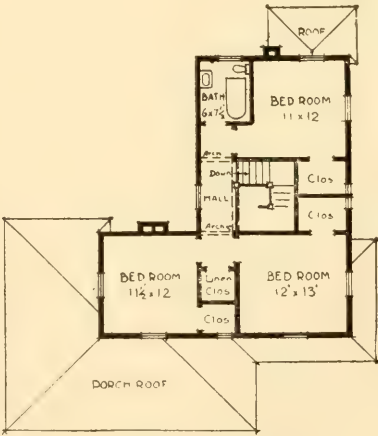
On the second floor are three pleasant

Plastering	175
Lumber	450
Millwork	425
Painting and Glazing.....	250
Plumbing, etc.....	250
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"Farm products cost more than they used to." "Yes," replied the farmer: "when a farmer is supposed to know the botanical name of what he' raisin', an' the entomological name of the insect that eats it, an' the pharmaceutical name of the chemical that will kill it, somebody's got to pay."

Publishers' Notices

"The Man on the Job."

Blessed is the man that has found his job and is in harmony with it. Such a man will do good service for his fellow men. Occasionally one meets a case so lacking in adaptation that it seems immoral for the workman to continue in it; but it is a joy to see a man working with enthusiasm and with efficient service.

Such thoughts often recur to the writer's mind as he sits at a table in The Stamford Lunch and notices how skillfully the proprietor, Mr. Fred McDermant, conducts his establishment. Mr. McDermant is in a class by himself. He stands distinctly and conspicuously beyond and above some of his fellows. He is efficient. In the writer's opinion Mr. McDermant is the most efficient restaurant manager that he has ever known. Hundreds of people in Stamford voice a similar sentiment. Skill, unflinching courtesy, the menu well selected, the food well prepared and attractive in appearance, are a few of the features that make an ideal restaurant. All of these, with minimum rates, may be found at The Stamford Lunch. Why do not some other restaurants elsewhere emulate his example? To do so would be to their advantage. Some other restaurants in other towns seem absolutely immoral in their slovenly and desultory conduct, with their lack of neatness and, perhaps still worse, their lack of courtesy.

We laud a man and build a monument to his memory when he dies in the service of his fellow men, but we should not forget to patronize as well as to honor the man that feeds his fellow men and does it well, and in these days of the high cost of living does it for only a moderate and honest compensation. Mr. McDermant is providing fare as good as can be found in New York City or in any other city at many times his prices. No one knows how he does it, but that he does it is pleasingly evident. Many attempts have been made to solve the puzzle. The only possible explanation is that he is exactly the man for the place.

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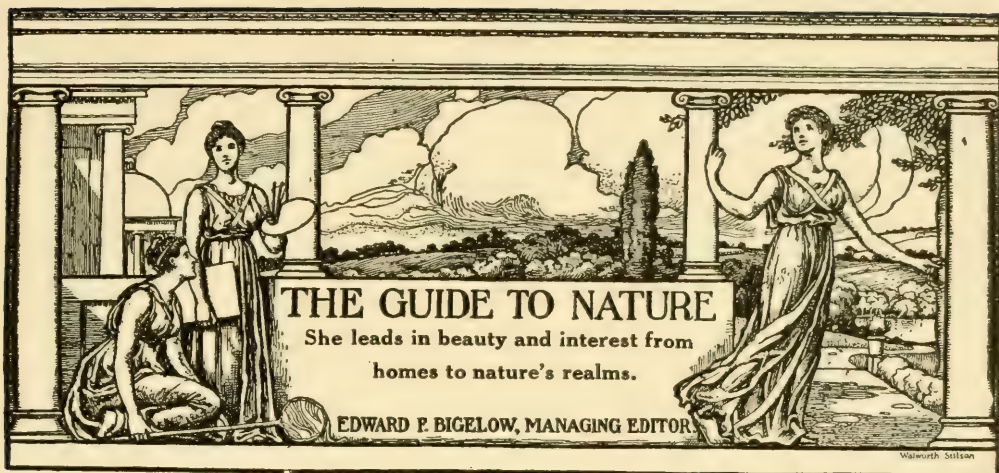
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Volume VIII

DECEMBER

Number 7

BOULDERS

By Professor William North Rice, Wesleyan University, Middletown, Connecticut

Probably few readers of this paper living in New England or in adjacent parts of the United States and Canada, have failed to notice the frequent occurrence of loose pieces of rock of different kinds varying in size from cobble-stones to masses many tons in weight. These boulders are often found lying on the surface of the ground. Sometimes a boulder is perched upon a ledge of rock very different from the boulder. Often-times a boulder rests upon a very small base, so as to suggest the idea that it would be easy to rock it and even to tip it over. Such boulders, in Burlington, Connecticut, are shown in Figures 1 and 2. Rarely a huge boulder is found so nicely balanced that it actually can be made to rock. While many of these boulders lie upon the surface, others are found beneath the surface, buried in a mass of disintegrated rock material in which coarse and fine stuff are mixed helter-skelter. The smaller boulders are often utilized for stone walls. Thus the fields are cleared of an incumbrance, and serviceable and picturesque walls are provided at small expense. Sometimes a boulder may be

recognized as a fragment of some more or less peculiar kind of rock of which a ledge is known to occur at some distance from the present situation of the boulder. In this part of the country, when we can recognize the probable source of a boulder, it is found that the boulder has moved southward from its original home, though the direction of its movement may have been considerably east or west of a meridian line. While most readers can verify most of these facts by their own observation, comparatively few have definitely asked themselves the question, what is the meaning of the facts. To answer that question is the purpose of this article.

Wherever ledges of rock are exposed to the atmosphere and to rain water percolating downward through cracks and crevices, the rocks tend to become disintegrated. The process is partly mechanical. Water freezes in the cracks and so splits the rock. Changes of temperature, between the blaze of sunshine and the coldness of night, produce alternate expansion and contraction which tend to shatter the rock

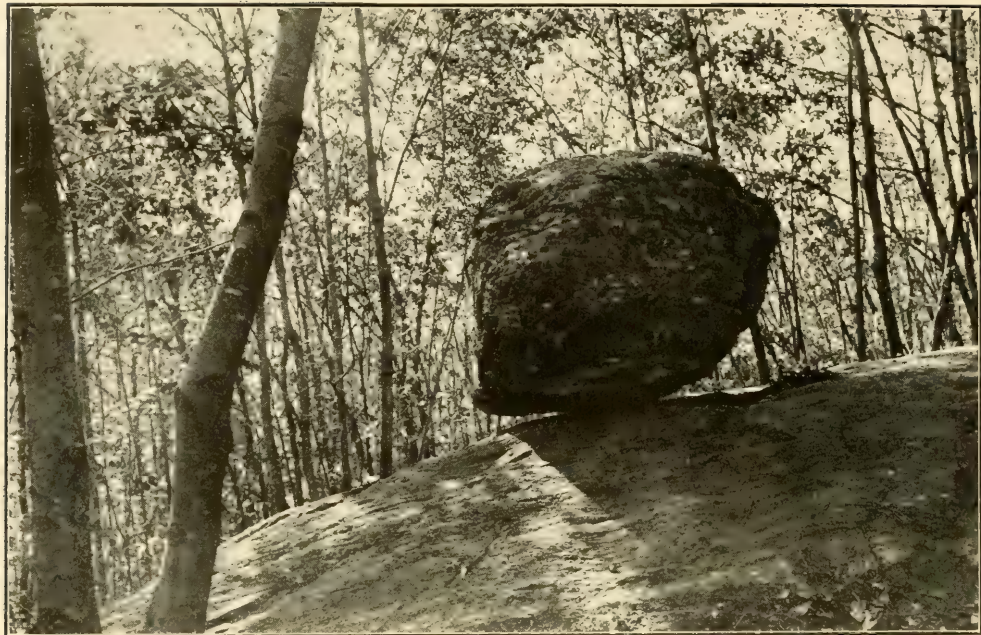


FIG. 1. GLACIAL BOULDER, BURLINGTON CONNECTICUT.

into fragments. But the process is partly chemical. Oxygen, carbon dioxide, and water decompose many of the minerals of which the rocks are made. As rain water penetrates downward in cracks, it carries in solution the oxygen and carbon dioxide of the atmosphere, and so this chemical decomposition or rotting of the rocks may

go on, not only at the surface, but in cracks many feet below the surface. Some parts of a rock mass may disintegrate more rapidly than others. So blocks of comparatively sound rock may be left, while other portions of the mass have crumbled into a coarse powder. The rain, especially on slopes of some degree of steepness, washes



FIG. 2. GLACIAL BOULDER, BURLINGTON, CONNECTICUT.

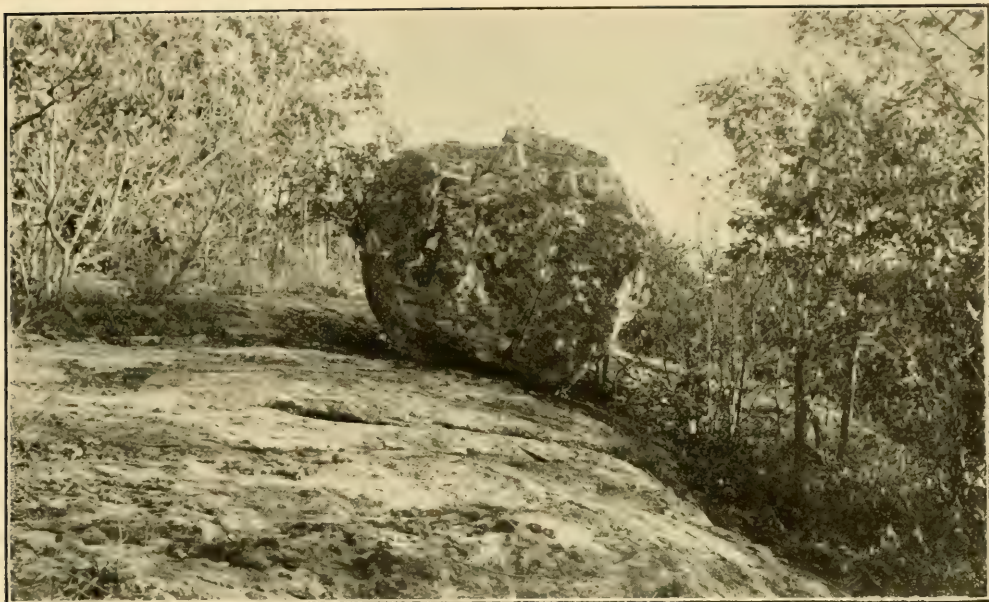


FIG. 3. GLACIAL BOULDER, BURLINGTON, CONNECTICUT.

away the fine material, leaving piles of the large fragments. The blocks tend to become rounded, since the edges and corners decompose more rapidly than the rest of the block. Thus are formed boulders of disintegration. A pile of such boulders near Butte, Montana, is shown in Fig. 5. Such boulders remain very near the place where they were found, and, in general,

they are of the same material as the underlying rock. It is evident, however, that in some way most of the boulders of New England have been transported to a greater or less distance from their original home.

The transportation of these boulders is due to the series of events which marked the Glacial period. Some tens of thousands of years, perhaps a few

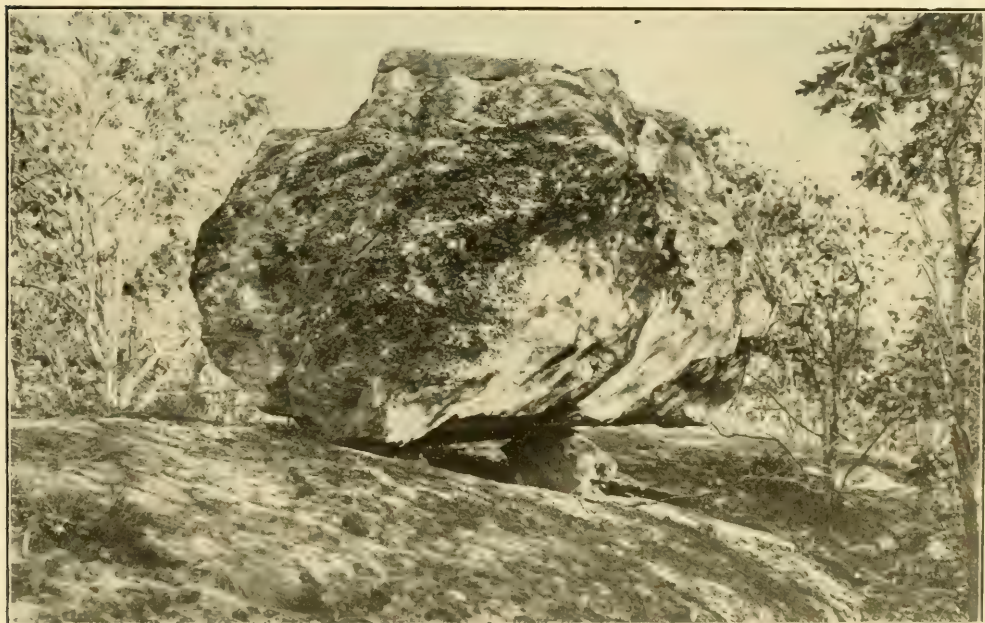


FIG. 4. ANOTHER VIEW OF THE BOULDER SHOWN IN FIG. 3.

hundreds of thousands of years, ago, there was a change of climate, by which the mean temperature at least of large areas of the earth's surface came to be somewhat lower than it had been in previous ages, and lower than it is at present. The cause of this change of climate is not certainly known, but the most probable theory is that it was due to a diminution in the amount of carbon dioxide in the atmosphere. It would not require a change of many degrees in the mean temperature to prevent the winter snowfall from melting away

St. Lawrence valley. If the mean temperature were reduced a little, a larger share of the precipitation would be snow, a smaller share would be rain. In the highlands between the St. Lawrence and Hudson Bay, the mass of snow accumulated in the Glacial period to a thickness of thousands of feet, and gradually extended itself in all directions. The weight of the mass of snow gradually consolidated it into ice, and produced a slow, creeping movement of that ice outward from the center of the area. At the extreme of glaciation



FIG. 5. BOULDERS OF DISINTEGRATION, NEAR BUTTE, MONTANA.

entirely in the following summer in considerable areas of Canada and northern New England. If a little of the winter's snow remains unmelted through the following summer, each winter will add somewhat to the accumulation, and the mass of snow will increase both in depth and in horizontal area. The snowfall is now very heavy in the track of the cyclonic storms which move northeastward down the

the thin edge of the great ice sheet had crept southward in the eastern United States to about the latitude of 40° . Farther west, where the air is drier and the precipitation less, the southern boundary of the ice sheet was hundreds of miles farther north. Several times during the long history of the Glacial period the climate became warmer, and the edge of the ice sheet melted back for scores or hundreds of miles,

and then the climate became colder and the ice again advanced. For a picture of the northeastern United States and eastern Canada during the Glacial period we may look to Greenland and the Antarctic continent.

Before this ice invasion, the northeastern United States and eastern Canada had been above the sea level for tens of millions of years. During all those long ages the rocks had been undergoing disintegration by the chemical and mechanical agencies which have been already referred to. On the lowlands the bed rocks were covered with a thick mantle of disintegrated rock, in which

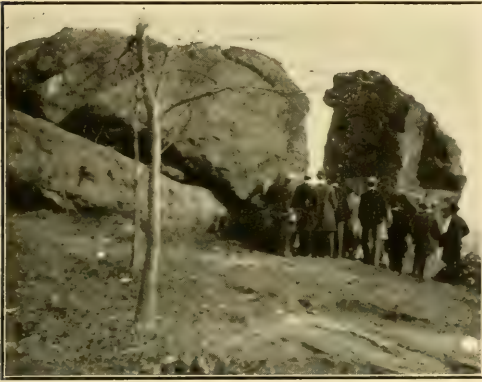


FIG. 6. JUDGES' CAVE, WEST ROCK, NEW HAVEN, CONNECTICUT.

there was a gradual transition from solid rock at the bottom to fine soil at the top. On the hill slopes rested numerous boulders of disintegration, where the more finely disintegrated material had been washed away by the rains. As the thickening ice sheet began to creep outward from its center, it shoved along vast masses of the disintegrated material, scouring in most places down to the fresh and unaltered bed rock. Hence it is that in these glaciated regions the mantle of disintegrated rock is almost everywhere composed of material which has been transported a greater or less distance from the place where it was formed. Rarely do we find in New England the gradual transition between unaltered rock and soil which is characteristic of the regions beyond the boundaries of the great ice sheets. Such an ice sheet would shove along in its resistless course boulders of disintegration



FIG. 7. BOULDER NEAR SOUTHTON, CONNECTICUT.

of every size, as well as the finer material. Herein lies a very striking difference between transportation by water and transportation by ice. Water moving slowly can transport only fine powder. Water plunging in a fierce torrent can carry boulders a few feet in diameter. In general, the weight of the largest block which moving water can carry varies as the sixth power of the velocity. But there is a limit to the size of the stones which can be moved by the fiercest mountain torrents. There is, on the other hand, no limit to the size of the rock masses which can be transported by the slowly creeping glacier. It carries coarse and fine material with equal ease.

A part of the material which is transported by every glacier is shoved along beneath the ice mass; and, in the case of a continental ice sheet, much the larger part of the material transported is at the bottom. But some of the mate-



FIG. 8. BIBLE ROCK, NEAR MIDDLETOWN, CONNECTICUT.



FIG. 9. COCHEGAN ROCK, MONTVILLE, CONNECTICUT.

rial is carried on top of the ice. From overhanging cliffs, frost and other agencies continually detach blocks of rock, large and small, which fall upon the surface of a glacier. In the case of a continental ice sheet, the amount of material on top of the ice is relatively small; but here and there sharp, rocky ridges protrude above the ice, and from such ridges the blocks detached by frost may fall upon its surface.

A glacier or a continental ice sheet carries thus at its bottom or on its sur-

face whatever loose material is furnished to it. But it does more than this. The ice with the material frozen into its bottom abrades like a colossal rasp the surface of bed rock over which it passes. If the bed rock over which it moves is intersected by cracks, the ice penetrates into those cracks. It freezes around the semi-detached blocks between the cracks, and so plucks them from their place and carries them forward. If the ice moves over a hummock in its path, it tears off blocks of rock from the top of the hummock, and the more rapid motion of the superficial ice carries these blocks forward over the stagnant ice in the lee of the hummock. Thus the rock material transported by a glacier is partly beneath the ice, partly on top of the ice, and partly within the ice.

When the ice finally melts, it drops its load. Coarse material and fine are left indiscriminately wherever they happen to be when released from the icy grip. Thus we see how it is that the bed rocks of New England are generally covered, not with material resulting from the decomposition and disintegration of the underlying rock, but with material of various origins transported by the glacier and dropped by



FIG. 10. BOULDER NEAR COBALT, CONNECTICUT

the melting of the ice. Thus we can understand how it is that the scattered boulders are apt to be of entirely different material from the bed rock underlying them, and how the boulders are sometimes perched in apparently insecure positions.

Some of the boulders are sufficiently large and conspicuous to have attracted general attention and to have received special names. Fig. 6 represents an interesting boulder on West Rock, near New Haven, known as the Judges' Cave, from a tradition that Edward Whalley and William Goffe, two of the members of the English Parliament who signed the death warrant of King Charles I., found shelter here from their pursuers. The separate blocks which now form the so-called Cave, or rather rock shelter, are all probably fragments of one huge boulder which has been shivered by frost since it found its resting place. The party represented in our picture are a group of professors and students who were visiting the locality on a geological excursion. Fig. 7 shows one of the largest boulders which I have ever seen in Connecticut.

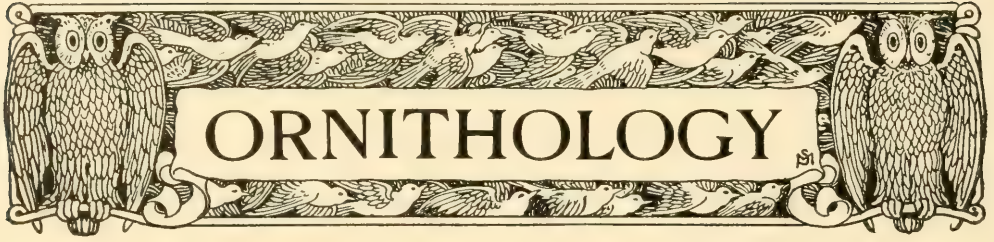
The locality is west of the village of Southington, near where the road crosses Eight Mile River. Fig. 8 represents a rather picturesque boulder in the southeastern part of Middletown, locally known as Bible Rock. The appearance of a half-opened book is due to the fact that the boulder of gneiss happened to be lodged with its planes of foliation nearly vertical, and frost work has spread the leaves of the book apart.

Figs. 1, 2, 3 and 4 show a group of picturesque boulders on the estate of the late Mr. James Terry, Burlington, Connecticut. The beautiful photographs from which these pictures were made were a gift to the writer from Mr. Terry. Fig. 10 shows rather oddly perched boulder near Cobalt, Connecticut. Fig. 11 shows an interesting boulder near the home of Mr. Mitchell Kennerley, Mamaroneck, New York.

Prof. W. O. Crosby, of the Massachusetts Institute of Technology, has shown that Cohegan Rock is not a boulder at all. It is simply a portion of the underlying rock which has resisted the erosive agencies that have carried away the surrounding part of the mass.



FIG. 11. BOULDER, MAMARONECK, (WITH THE EDITOR OF THIS MAGAZINE), NEW YORK.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

The Birds' Christmas.

Let us not forget the birds in our Christmas plans. There are several ways in which we may be able to help them, chiefly in providing food and shelter.

About the house we may put out extra bits of suet, tying them to the trees or bushes where our guests may be easily ob-

sitting-room window, while the bird fed contentedly from a strawberry basket attached to some shrubs, close beside the walk and but a yard or two away from the window. Blue jays, chickadees and nuthatches also fed from the scraps placed in this basket.

Birds soon learn to know their friends and are quick to show their confidence in this way. As suggested in the October number, if we started putting out food early in the season we should be more likely now to have daily visitors among the birds. Bread crumbs and grain are good for the tree sparrows and juncos, and nuthatches and woodpeckers seem to delight in picking at a bone containing dried bits of meat, hung from the trees or wedged in the branches. This gives a variety from the suet.

Window boxes have special advantages in being easily cared for and the food supply kept up from within, besides being ideally situated for studying the birds at their feeding, and they may be varied in many ways. Small evergreen trees may be fastened upon them and bits of food attached to these, or the scraps simply scattered on the floor of the box.

The "food stands," some of which are quite elaborately made, are well suited for keeping the food protected from the weather, and at the same time allowing of free access. Seeds and crumbs should be kept dry.

Shelter and protection from severe weather and storms are also much appreciated by the birds. Evergreen trees and thickets of shrubs offer protection to many about the houses, while brush heaps, stacks of corn, etc., are made use of by quail and pheasants in the fields and pastures. In severe winters, especially when the ground is covered with snow, pheasants and bobwhites have a hard time in procuring food and will often come up into the door-yards in search of it. Mixed grain should be scattered in places kept clear for this purpose. When ice covers the twigs and berries the ruffed grouse



A DOWNY WOODPECKER AT LUNCH.'

served from the windows, thus affording an added amount of pleasure to those indoors who may be interested to watch them. The picture of the downy woodpecker here shown was taken from a

cannot procure food in the woods, and goldfinches, siskins and other seed eaters are unable to get at the weed-seeds, birches and cones. In severe cases even the crows, jays and woodpeckers are affected, being deprived of their usual sources of food supply.

Probably many birds each winter die of starvation. They seem capable of withstanding almost any amount of cold if they can only secure food enough to keep up the bodily functions. This is shown by the occasional wintering over of birds which usually go south, in localities where they find food in plenty.

The ground feeders are of course more seriously affected by the deep snows, and excursions into the woods to scatter grain for them may be the means of saving many and it should bring us pleasure to do it. The snow should be trampled down, or preferably cleared to the ground, and such places ought to be visited frequently to keep the patches open and supplied with grain. Oats, chaff, buckwheat and cracked corn may be used. A mixture is good. It is also desirable to scatter sand or fine gravel among the grain, as birds need this to aid in digesting their food. Piling up brush or making temporary wind-breaks along the most exposed sides of such clearings will assist in keeping them clear of drifting snows



A CHICKADEE ON TOP OF THE WINDOW BOX.

and at the same time offer shelter for the birds.

Snow-shoes make excellent shovels in lieu of wooden or steel ones, and pockets may be readily filled with grain, so there is no excuse for our not sharing with the birds some of the good things in our winter tramps afield.



SCATTERING GRAIN IN A CLEARING MADE IN THE DEEP SNOW.

Versatility of the Mockingbirds' Song.

Within the past two or three years mockingbirds have been reported from several localities in eastern Massachusetts, these birds usually wintering in the vicinity where they have made their appearance. The Arnold Arboretum at Forest Hills has been one of these favored localities, having harbored one of the versatile songsters during the winter of 1914. It was here also during several weeks in October just past that a mocker has been observed, which in all probability will make this spot its winter home.

Probably no bird has a more remarkable song in its power of mimicry and variation, although there appears to be a great difference shown by individuals in this respect and many display no more mimicry than a catbird in their songs. Though loved by the inhabitants of the southern states where it abounds, few who have not visited that section have had the pleasure of listening to the mockingbird's sweet chorus,—for chorus it seems, appearing to be made by many birds rather than the performance of an individual songster, especially when the individual is of the mimicking type.

Listening to such an outburst one fine October morning in the Arboretum, I seated myself under the edge of a large clump of forsythias while the bird sang from the thicket within a few yards of my head. The performer's *repertoire* was in this instance a somewhat remarkable one, and I noted the succession of its imitative songs and calls. This out-pouring of melody lasted between fifteen and twenty minutes, during which time I recognized exact imitations of the following, which were given in the order named.

Red-shouldered hawk, call; robin, song; red-eyed vireo, song; chewink, call; phoebe, call; blue jay, call; robin, song; downy woodpecker, call; chewink, call; blue jay, agitated call; chickadee, (day, day, day call); bobwhite, call; catbird, cat call; barn swallow, twittering song; cat-bird, song; robin, song and calls; English sparrow, chattering; blue jay, call; wood pewee, call; brown thrasher, song; robin, song; chickadee, call; catbird, song; English sparrow, scolding; American goldfinch, call; catbird, call; robin, song; blue jay, call; flicker, short call; bobwhite, call; blue

jay, several calls; robin, various calls; red-breasted nuthatch, "yank"; robin, call; flicker, call; brown thrasher, song; bobwhite, called twice; phoebe, called three times; flicker, (wicker, wicker, wicker call); song sparrow, song and call; chewink, call; bobwhite, both calls; robin, several calls; blue jay, several calls; kingfisher, rattle (twice); chickadee, call; blue jay, call (five times); flicker, various calls; robin, song and calls; chickadee, calls; swallows, twittering; red-winged blackbird, nest call; warbling vireo, full song; blackbird "chip"; white-breasted nuthatch, calls.

Interspersed between many of the above were various bits of melody which I did not know—perhaps memories of the sunny south-land. The common calls and songs of nineteen different species were here given in as many minutes, in addition to several less familiar calls of some of these same birds, which I distinctly recognized.

A northern race of these energetic and hardy songsters would certainly be a valuable addition to our avi-fauna. May their tribe increase.

With the Audubon Societies.

Under the title "Birding with Colonel Roosevelt" the Rev. Herbert K. Job, Professor of Applied Ornithology for the Audubon Societies, is bringing forward a new illustrated lecture for the benefit of the Audubon work. Mr. Job, in his recent trip with Col. Roosevelt to some of the southern bird rookeries and protected areas, took *over three miles* of motion picture film in addition to many photographs, showing the bird life of these sections.

* * * * *

The campaign against the cat as a bird-destroyer is being pushed vigorously, and the matter thoroughly investigated. It is hoped that the time may soon come when sentiment ceases to interfere with this important action. Regulations and "cat ordinances" are already enforced in some places, but until they become more general the destruction will go on.

The wandering cat is a serious problem. Last year the S. P. C. A. put to death nearly one hundred and seventy-five thousand of these unfortunates in New York City alone. It is stated that five cats on the New York state game farm killed and ate \$5000.00 worth of young pheasants before the marauders were finally rounded up and killed.

Some Notes on the Passenger Pigeon and Its Recent Reported Occurrence in Minnesota.

What was generally believed to be the last survivor of that great army of passenger pigeons which swarmed in almost unbelievable numbers over our continent in the days of Audubon, died in the Zoological Gardens at Cincinnati, Ohio, on the first day of September, 1914. This bird—a female—was born in captivity, and was twenty-nine years old. Since that time

that they had perished in storms or had been wiped out by disease, though as the seasons went by and no birds reappeared the former theory soon died out, and from the best obtainable reports it appears now conclusive that destruction by man has been the ultimate factor in causing the disappearance of the wild pigeon.

That there may yet remain a few of these birds alive seems not altogether impossible, and a report coming from the Rev. Dr. Francis L. Palmer, of Stillwater, Minnesota, that he believes he has seen a



PASSENGER PIGEONS AT ONE TIME IN CAPTIVITY IN HYDE PARK, MASSACHUSETTS.

large rewards have been offered for the finding of a nest of a wild pigeon, and occasionally reports of one or more of these birds having been seen would be brought to the attention of ornithologists, only to find that the observer had been mistaken and that the birds in question were mourning doves, band-tailed pigeons or some other species resembling the true "wild" or "passenger" pigeon.

Notwithstanding the relentless persecution and slaughter of these birds throughout their range, their disappearance took place so suddenly and the annihilation of the species was apparently so complete that it has called forth considerable speculation as to the direct cause of this catastrophe. Many believed that it was but a temporary disappearance and that for some unknown reason the diminishing flocks had migrated to new fields; others,

passenger in the vicinity seems to be a well-authenticated record of its recent appearance, which, he states, occurred on the thirty-first of May, 1915. Noting this occurrence mentioned in "Bird-Lore" I wrote Dr. Palmer for further particulars and previous records in his locality.

In the instance mentioned, Dr. Palmer, who has studied the birds of Minnesota for fifteen years, was accompanied by his daughter and two other observers and had a good opportunity of observing the bird and noting its call. While skepticism always pushes to the front in such cases, reasonable testimony must be accepted and there appears very little chance of the parties being mistaken in this instance. That the mourning dove is common in the vicinity and was well known to the observers; that the band-tailed pigeon has never been known to occur in that part

of the country, and that the calls of the bird which they saw and heard were totally different from those of either of the above species and exactly coincided with the calls attributed to the passenger pigeon, are convincing facts which point almost to a positive identity. Dr. Palmer also states that they were familiar with a stuffed specimen of the wild pigeon in their school collection, and its comparison only served to strengthen their belief in the identification of the bird which they saw.

Regarding recent previous records, he writes as follows: "A retired lumberman thinks he saw one a year ago when riding in his automobile in the vicinity. Dr. E. S. Boleyn, a trained observer, four years ago saw a pair of great wild pigeons which he was sure were passenger pigeons."

It is difficult to comprehend the extent of the flocks of these beautiful birds, as recorded by the early observers. Even a comparatively few years ago they were not deemed especially valuable and notwithstanding their former abundance many of the museums have but a few specimens to represent this vanished multitude. Even those familiar with their habits did not seem to realize their danger of extinction. I well remember a market-man friend telling of their receiving the pigeons minus their wings, that they might get more of them packed into a barrel, and of his being ridiculed by his fellows when he ventured to prophesy that they would see the day when there would be no more wild pigeons in the market.

My own observation of these birds was limited to a flock of about fifteen kept in a large enclosure at the Webster Public Museum at Hyde Park, Mass. The accompanying photograph, taken through the cage, while not very distinct, is interesting to show the characteristic attitudes of these birds and their constantly alert, half-wild appearance which they always seemed to preserve. For the use of this picture we are indebted to the Frank Blake Webster Co., proprietors of the museum. These pigeons, which were brought from Indian Territory, were accidentally liberated by some workmen in the spring of 1894, and for about two years thereafter occasional reports of wild pigeons being seen in this vicinity were brought to the attention of the Museum,

about the last report coming from Sharon, some fifteen miles southward.

The following paragraph from "The Story of my Boyhood and Youth" gives us a delightful bit of insight into the habits of these noble birds, as observed by the master mind of John Muir, during the early days of his life on the Wisconsin farm.

"It was a great memorable day when the first flock of passenger pigeons came to our farm, calling to mind the story we had read about them when we were at school in Scotland. Of all God's feathered people that sailed the Wisconsin sky, no other bird seemed to us so wonderful. The beautiful wanderers flew like the winds in flocks of millions from climate to climate in accord with the weather, finding their food—acorns, beechnuts, pine-nuts, cranberries, strawberries, huckleberries, juniper berries, hackberries, buckwheat, rice, wheat, oats, corn—in fields and forests thousands of miles apart. I have seen flocks streaming south in the fall so large that they were flying over from horizon to horizon in an almost continuous stream all day long, at the rate of forty or fifty miles an hour, like a mighty river in the sky, widening, contracting, descending like falls and cataracts, and rising suddenly here and there in huge ragged masses like high-plashing spray. How wonderful the distances they flew in a day—in a year—in a lifetime! They arrived in Wisconsin in the spring just after the sun had cleared away the snow, and alighted in the woods to feed on the fallen acorns that they had missed the previous autumn. A comparatively small flock swept thousands of acres perfectly clean of acorns in a few minutes, by moving straight ahead with a broad front. All got their share, for the rear constantly became the van by flying over the flock and alighting in front, the entire flock constantly changing from rear to front, revolving something like a wheel with a low buzzing wing roar that could be heard a long way off. In summer they feasted on wheat and oats and were easily approached as they rested on the trees along the sides of the field after a good full meal, displaying beautiful iridescent colors as they moved their necks backward and forward when we went very near them. Every shotgun was aimed at them and everybody feasted on pigeon pies, and not a few of the settlers feasted also on the beauty of the wonderful birds."

Nesting of a Bullock Oriole.

BY F. H. VAN HISE,—SUMMERLAND, B. C.,
CANADA.

On June 7th, 1915, noticing a Bullock Oriole (*Icterus bullocki*) trying to pull strings from a piece of carpet that was hanging on the clothesline, I put the carpet on a wire running along the front of the porch and placed upon it short pieces of string.

The bird, which was a female, would come and get the string while I was on the porch, being gone only two and a half to three minutes at a time when she would



BULLOCK ORIOLE WITH STRING.

return for more. The nest was about a hundred feet from the house.

The male did not help with the nest-building but the female worked all day on the seventh and eighth and until eleven-thirty on the ninth, taking fifty strings, each about a foot long, on the latter day. The nest was then finished except for lining.

Early on the morning of the eleventh she came again and called to me. I thought perhaps she was after more string but that was not what she wanted, so I combed some hair out of my collie and put that up for her. She soon came and took several big mouthfuls, with which she lined the nest.

The young left the nest on the twelfth of July.



BULLOCK ORIOLE NEST COMPOSED MOSTLY OF STRING.

The 1916 Audubon Bird Calendar has been issued and may be secured at the various state departments of the society.

Starry blossoms and blossomy stars
Bedeck the earth and the sky;
Let us not go about with unseeing eyes,
That pass these beauties by.
—Emma Peirce.



INTERIOR OF NEST, LINED WITH HAIR FROM COLLIE DOG.



"ANYBODY HERE."

"DID SOME ONE CALL."

"OH THERE YOU ARE."

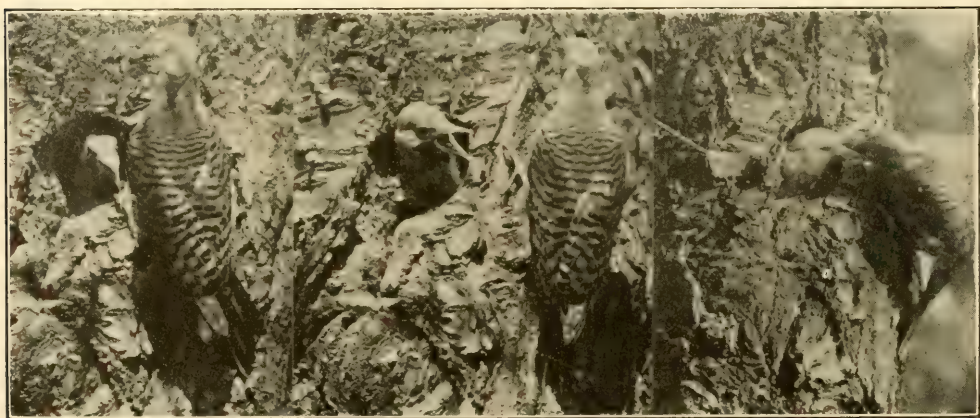
The Flicker at Home.

BY CLARENCE BUNDY, TACOMA, OHIO.

It was the middle of April. Birds were everywhere. The flickers were beginning to remodel their summer home—located in a dead cherry tree by the yard fence.

For several days they worked at the digging and the cleaning until the hole was five inches in diameter and

After a week or so all became quiet. Had the birds gone to find a more suitable abode? Investigation proved that they were at home, for a tap on the tree brought the female bird to the front door. About the middle of May, things began to happen around the old cherry. The days of patient brooding were over, and the duties of hunting for food and training the young were added to the ordinary routine. One



"YES, I'VE RETURNED."

"DO YOU LOVE ME YET?"

"YUM, YUM, YUM."

eighteen inches deep, a more spacious apartment than the former occupants, also flickers, had owned during the previous year.

Occasionally they took resting spells, on a nearby trellis, there going through the craziest performances, bowing, scraping, spreading wings and tail, and sounding their rolling wheet-ur, wheet-ur, wheet-ur. It was curious love-making when viewed from a human standpoint.

morning when the male bird flew to the hole he was met by one of his greedy offspring whose energy had brought him to the edge of a new world. Before giving up the morsel of food, the male flicker often sat propped on his tail at one side of the hole just out of reach presumably giving a lesson in patience, though I should say that the vocal apparatus was most benefitted.

And how they grew. So fast that the

home soon became too small, and one morning, one little savage, spreading his over confident wings, landed ignominiously in a crestfallen heap amongst the weeds, and got scolded for his pains.

In passing the old cherry a few days later, I could but mark the silence that brooded about the tree, lately so full of life. The old birds paid it an occasional visit, but for the rest of the year their interest in it was over.

Birds seem to thrive best in human society in spite of the fact that their experience has not been entirely reassuring. The great crested flycatcher, naturalists say, "is a shy, solitary bird seldom seen beyond the deep forest." Yet this summer I found a pair nesting in the hollow limb of an apple tree in a neighbor's yard.

Let the birds come back. Let us help them to come, realizing that our existence depends in large measure on their companionship and continuance.

Nature Interest Rewarded.

BY CLARENCE BUNDY, TACOMA, OHIO.

The student of nature that shares his interest and knowledge with the youths of the neighborhood receives his reward quickly and repeatedly. So do they.

If every community could have as one of its members an earnest nature student, well might that community rejoice for he is or may become a mighty factor in elevating the ideals of the boys and girls.

I know a boy whose companionship is dear to me. He accompanies me on rambles through the woods and the byways, sharing every observation and showing a lively interest in things pertaining to birds and insects. It was not always so. His parents moved from the city to the country to remove him from the evil influences that were fast making him a little ruffian.

It has been my privilege to watch his mental and moral outlook rise and broaden, influenced by his glimpses of the wonderful things in the great outdoors. I also have a Sunday school class and some other young friends whom I have interested in this subject. A quail's nest was discovered one day in the lane that leads to the main road, and not many rods from the home of

the boy that found it. I was called by telephone to photograph the nest.

It was a wonderful affair of soft grasses woven into a deep round structure and roofed over with similar material, and with a hole in the side only large enough for the plump little body to slip in and out. The boy told me that he would never have found it had not the mother bird flown from the nest at his feet. In this snug little home were nineteen eggs.

Ten days later the telephone rang again. A voice, eager and full of excitement responded and bade me come as "quick as you can get here." The boy had been working in an adjoining field and as he passed the nest he saw a sight few are ever fortunate enough



"THE QUAILS WERE HATCHING."

to see. The quails were hatching. Tiny brown heads were sticking out around the mother's breast, and taxing her spreading capacity to the utmost. We cautiously proceeded to record this unusual sight, making the first exposure with a nine inch lens, fearing to go close enough to use the seven inch Anastigmat.

A few leaves and blades of grass interfered with the view, so my friend took the tripod and carefully pulled them aside (note the tripod in the corner holding down the grass), after which I made another exposure within three feet of the subject. I was not yet satis-

fied. The boy then took the tripod and pulled away the grass from within three inches of the mother's bill and she showed no sign of fear or nervousness. Her young birds were too precious to be deserted for any such ordinary disturbance.

I made No. 3, and left the patient little creature to rear her brood in peace.

The March of the Penguins.

We are indebted to Robert Cushman Murphy, Acting Curator of Natural

beaches that separate various arms of the bays, or which lead from the sea to the snow-water ponds in which the penguins delight to play, they follow regular, well-tramped avenues. When bent on a definite journey across the land, they trudge along very steadily and unconcernedly, and for the time seem to take no notice of their fellows. When in great haste, they fall upon the belly and run on all fours. By this well-known mode of progression, called "tobogganing," they lead a man a very creditable chase. Their most curious attitude is assumed when they walk



THE PENGUINS' MARCH TO THE SEA.

Sciences of the Brooklyn Museum for the accompanying illustration of the marching penguins of which he has made extended studies in South Georgia. He makes the following interesting statements regarding these curious birds:

"The johnnies walk in a deliberate manner, raising their feet high at each step, carrying their tails well above the ground, thrusting their wings behind them as balances, and poking the head forward into the accustomed near-sighted attitude. Their near-sightedness is probably no less real than apparent, because of the specialization of their eyes for vision through a medium of water.

"In crossing the stony or hummocky

down an incline, such as a snow-bank or a steep beach. The head is then thrust so far forward that the straight neck and the spine form a right angle; the wings are held stiffly back as far as possible, and the round belly projects as the bird proceeds with gingerly steps. On rare occasions they hop instead of walking, springing with both feet from one beach pebble to another, in the manner of the true "rock-hopper" penguins *Eudyptes*. Their fat bodies seem to be able to stand hard knocks, for not only do they tumble over frequently wherever the walking is rough on shore, but they also suffer fearful batterings on the shingle when they come out of the surf, sometimes being bowled over by four or five successive

breakers before they can scramble out of the undertow.

"When wading into the water, the johnny penguins invariably round their shoulders, bend down their heads almost to their feet, and scoop beneath the surface as soon as there is depth enough to float them. Once under way, all their terrestrial awkwardness vanishes. They swim with well-nigh incredible speed, remaining below the surface except when they leap out porpoiselike, giving an audible gasp for air—to be gone again within the twinkling of an eye.

"As long as young penguins were on this nesting ground, processions of adults might at all times be seen coming and going between the high land and the sea. The birds met and passed each other without a visible sign of recognition, each trundling gravely along on its own business. A broad thoroughfare had been stamped across the moraine, worn down doubtless through generations of the pattering of little leathery feet, and deeply grooved, sinuous avenues extending up the long snowbanks to the highest portions of the colony two kilometers from the shore.

"The antiquity of the hill-climbing instinct among the johnny penguins of South Georgia is attested by a strange and romantic phenomenon, namely that the penguins go back to the heights to die. In a hollow at the summit of the coast range south of the Bay of Isles lies a clear lake on a bed of ice-cracked stones. This transparent pool, with a maximum depth of three or four meters, is a penguin graveyard. In January, 1913, I found its bottom thickly strewn with the bodies of penguins which had outlived the perils of the sea and had apparently accomplished the rare feat among wild animals of dying a natural death. They lay by scores all over the stony bed of the pool, mostly on their backs with pinions outstretched, their breasts reflecting gleams of white from the deeper water. Safe from sea leopards in the ocean and from skuas ashore, they took their last rest."

An English naturalist reports a weasel feeding on frogs.

Two Skillful Fishermen, the Heron and the Kingfisher.

BY THE REV. MANLEY B. TOWNSEND,
NASHUA, N. H.

(Photograph by H. G. Higbee).

Long before the white man invaded the wilds of America and began to exterminate the fish and game with rod and gun, those fine old fishermen, the herons



THE GREAT BLUE HERON.
These beautiful birds add much to the life of our streams and marshes.

and kingfishers, fished our lakes and streams. Indigenous to our soil, like the red man they took what necessity required, making no appreciable impression upon the teeming waters. Then came the white man and began his dread work. Once the trout swarmed everywhere—now one must seek the remote wilds to find these speckled beauties in any considerable numbers.

Yet every once in a while some group of fishermen breaks out in stupid antagonism to the feathered native anglers, denouncing them as destroyers of fish, and seeking legislation to allow their destruction. Most states have seen such attempts,—attempts that are frustrated only by concerted action on the part of bird conservationists.

An instance of this sort occurred last winter in New Hampshire. Some fishermen, with more zeal than wisdom, introduced a bill into the legislature to remove

protection from the great blue heron and the kingfisher on the plea that they destroyed fish. Only prompt and energetic action by the Audubon people killed the pernicious measure and saved these fine birds to the landscape of the state.

Undoubtedly herons and kingfishers do catch fish. But who has a better right? Who was here first? To whom do the lakes and streams belong? It is true that these birds sometimes work havoc at fish-hatcheries, but my friend, the Superintendent of the United States Fish Hatchery at Nashua, N. H., keeps a dog that drives off all such poachers. He has no trouble.

Everybody knows or should know, that the heron is a wading bird and subsists ordinarily not upon game fishes, but upon frogs, minnows, chubs, suckers and fishes that frequent shallow water; but even if these birds did feed upon game fishes, would that warrant their destruction? As a matter of fact there are a dozen persons who enjoy watching the heron at his frogging and fishing and whose hearts leap up when they behold him winging his way across the sky on great, strong, wild wings, to one person who pursues the piscatorial art. These people have rights in the wild life of the land as well as fishermen in the fish of the waters. I have done much fishing in my day. It is a healthful and invigorating pastime,—but when I go fishing I go for more than the mere catching of fish. I go to get out into the great wonder-world. I go to get into touch with nature. I go to see the trees and the wild flowers, and the ferns and the birds. I go to see the herons and the kingfishers at their fishing. I like to catch fish, but even if I catch no fish, I go home enriched. I carry back something in my mind and soul better than fish in a basket. Old Mother Nature has placed her hand upon my head with healing power.

Heron and kingfishers destroy the fish, do they? The boot is really on the other foot! Man has reduced our fish and game almost to the vanishing point. Let justice be done. Let the feathered bipeds alone and let featherless bipeds remember that "people who live in glass houses should not throw stones." Our streams can be re-stocked with fishes, but our feathered friends once destroyed can never be replaced.

* * * * *

Our friend is right. We should be

broad enough to look upon these matters with an unbiased mind. Neither the blue heron nor the kingfisher are destroyers of edible fish in general. There may be instances where they do damage and these cases should be regulated accordingly. We should see something besides fish when we go a-fishing, and we should not make laws to favor and satisfy a few, that will restrict and deprive many of the legitimate pleasure of enjoying our wild life.—H. G. H.

A Barn Owl's Remarkable Attitude.

North Salem, Indiana.

To the Editor:

Can you or any of your readers guess at first glance what is the thing shown in the accompanying illustration? It is a barn owl that had been frightened



A BARN OWL FRIGHTENED BY A DOG.

by a dog that passed near him just as I was going to take his photograph. In his terror the owl assumed this position, with bill and tail on the ground, body raised as high as possible, wings spread like fans and hiding his body.

It is amusing to hear the guesses as to what the photograph represents. Some call it a stump, some a stone.

FRANK B. HOPKINS.

Steamship St. Louis, of the American Line, reports encountering a swallow almost in mid-Atlantic, 560 miles from the nearest land. The bird, though evidently tired, was by no means altogether spent.



GOD'S HELPER

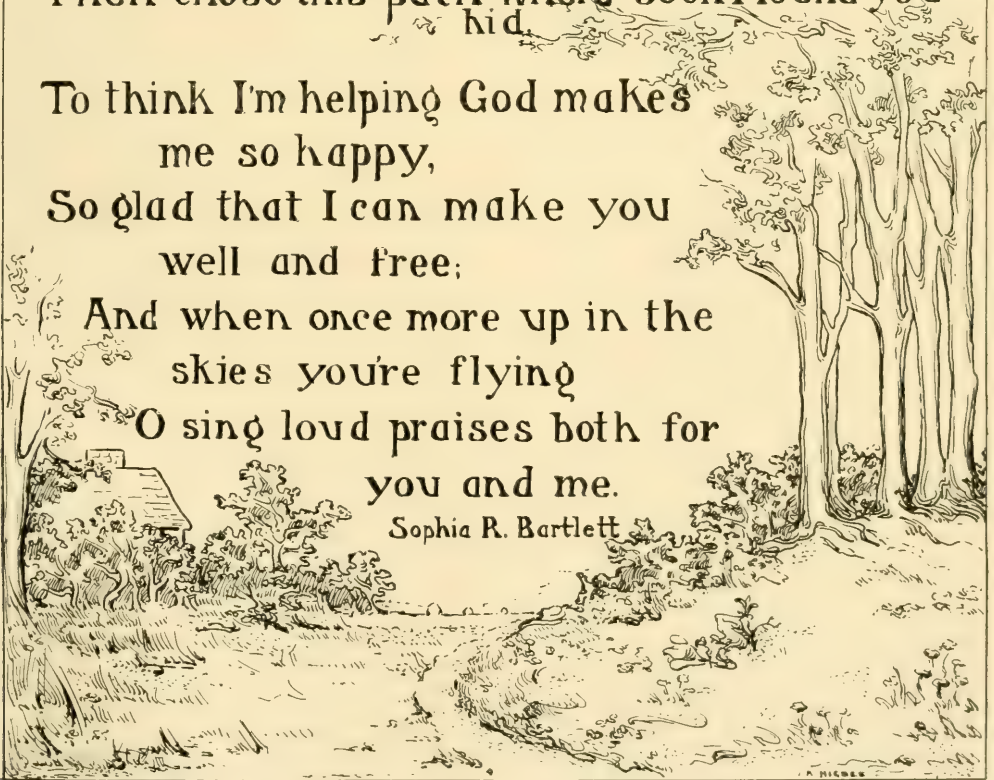
When in the orchard path
I found you,
Where hurt and trembling
in the grass you lay,
I truly thought God had
forgotten
To note your falling this
hot summer day.

But auntie said 'twas God who sent me to you,
And Birdie dear, I truly think He did;
I had made plans to go beside the maples,
Then chose this path where soon I found you
hid.

To think I'm helping God makes
me so happy,
So glad that I can make you
well and free;

And when once more up in the
skies you're flying
O sing loud praises both for
you and me.

Sophia R. Bartlett





TO KNOW THE STARRY HEAVENS

Contributions to the Sound Beach Observatory.

Miss A. P. Cobb, Sound Beach...	\$ 1.00
Frederick H. Getman, Ph.D., Stamford	5.00
Mr. Charles B. Allyn, Riverside, Conn.	5.00
Mr. Arthur F. Estabrook, Boston, Mass.	25.00
Mr. L. S. Miller, Sound Beach...	2.85
Mr. Mason Parker, Greenwich...	5.00
Mr. Alfred Gilbert Smith, Greenwich	25.00

Total\$ 68.85
Previously acknowledged.....\$ 932.58

Grand Total\$1,001.43

Only \$150 more needed. Please
clear that up before the Holidays.

* * * * *

The Heavens in November.

BY PROF. ERIC DOOLITTLE, OF THE UNIVERSITY OF PENNSYLVANIA.

THE whole eastern half of our evening heavens now appears a most beautiful spectacle. The great group Taurus has mounted more than half way to the zenith; the very beautiful, bright Gemini covers a large part of the sky toward the east, while above this last constellation we see the very brilliant, golden Capella and below it there shines the bright, bluish Procyon, a most beautiful double-sun system known as the Lesser Dog Star.

Below Gemini, in the northeast, there has again appeared that strange, faint little group of the Crab, within whose borders is the misty little patch of light known as the Little Cloud to the ancients and which even the smallest telescope will show to be a loose cluster of about 150 suns. When, in a clear sky, this little cloud grew more and more indistinct, and perhaps finally entirely disappeared, it was regarded as a certain sign of rain. Thus it was employed as a sort of weather-glass, though it would appear that the wonderfully delicate, filmy haze

of stars forming the constellation known as the Maiden's Hair should have been still more useful for this purpose.

* * * * *

A New Attendant to the Dog Star.

Following along the horizon from Cancer toward the south, we next come to the wonderful Dog Star, Sirius, the brightest star of the entire heavens. It will be remembered that so early as 1844 it was known that this great sun must have a companion sun revolving around it, for a mathematical investigation showed conclusively that Sirius was continually being disturbed by the gravitational pull of some unseen body. It was not until the year 1862, however, that the companion was actually seen in the telescope.

Within the last two months another excessively faint little star has been discovered near Sirius. The new body is 31 seconds south of the bright star and of only the fourteenth magnitude; that is, it is only one one-hundredth part as bright as the old companion.

It is probable that this very minute body is not physically connected with the bright star but that it is almost infinitely far away and only happens to lie in the same direction and hence to be seen apparently near Sirius in the sky. As the latter star is, however, drifting so very rapidly through space that it is displaced in its apparent position on the sky by no less than one three-tenths seconds every year, it will require the measures of but a few years to decide whether it is carrying the new companion along with it or not.

* * * * *

The Constellation Orion.

But most interesting of all the star groups which have recently entered the sky is the very brilliant Orion, that most wonderful midwinter constellation which is brighter and more striking than any other star group of the heavens. The head of this mighty hunter is marked

by the naked-eye cluster of stars at A (Figure 1), the shoulders being at B and C; the (bent) right knee is at E, and the left foot at D. The stream of stars from H to K represents the Lion's Skin, held on the left hand and arm, while the right hand is at L. The orange-reddish star at B is the brightest star of the constella-

but how much solid matter there may also be involved in it we do not know. The spectra of certain of its stars are so identical with its own that it is practically certain that these are immersed in and are a part of the cloud itself.

As to the true size of this great cloud, it is so great as to be entirely inconceiv-



Figure 1. The Heavens at 9 P. M., December 1. (If facing south, hold the map upright. If facing east hold East below. If facing west, hold West below. If facing north, hold map inverted.)

tion, while the bluish sun at D is next in brilliance. The former is irregularly variable, so much so that in December, 1852, it was actually for a short time the brightest star of the entire heavens; the latter is a triple star.

* * * * *

New Discoveries in the Nebula of Orion.

It is, however, in the position N that there is found what is by far the most wonderful object in this constellation. This is the very well-known nebula in Orion, the greatest nebula of the sky and a beautiful object of wonderful complexity. This is one of the purely gaseous nebulas; that is, the light with which we view it emanates from luminous gases,

able. If we can imagine a great globe formed about our sun, and so large that it will always contain our moving earth within it—that is, if we imagine the distance through this globe to be about two hundred millions of miles, then it is certain that it would require more than one million of these globes to equal in bulk this great nebulous cloud.

Very recently the announcement of certain results from wonderfully delicate measurements has attracted the attention of astronomers anew to this extraordinary object. By two quite different processes it has been found possible to measure in miles per second the velocity with which any selected portion of the nebula is moving toward us or away from us,



Figure 2. The great Nebula of Orion.

and when this was done the results found were most surprising.. For it then appeared that all the little portions were moving with different speeds: of two regions very near together, one might be moving toward or away from us eight or ten miles per second faster than the other.

In other words, instead of the nebula being a great, still mass of nearly quiescent gases, the entire cloud is violently surging and streaming in a most com-

plicated manner. Without doubt observations upon this wonderful object will be industriously continued and multiplied during the next few years. Possibly our at present very imperfect, knowledge of the true nature of gaseous nebulas may soon be very greatly extended. If so, a new light may be thrown, not only upon these objects, but also on the nature of new stars, and upon many other difficult matters in astronomy.

The Planets in December.

Mercury passes behind the sun on December 15, and will therefore be wholly invisible throughout the month.

Venus is steadily withdrawing from the sun's rays and coming into better position for observation. On December 1 it

It is so near the stars R and S (Figure 1) that from even only a few nights' watching its westward motion may be clearly seen. It will pass to the west of R on December 27, though toward the beginning of the month it will be seen far to the east of this star. The rings of Saturn



Figure 3. Two recent drawings of the Planet Jupiter. The borders of the faintly colored bands and all of the markings are, however, constantly changing.

sets 1 hour and 20 minutes after sunset, and this time is increased to two hours by December 31. The planet must be looked for far toward the south of the west point of the horizon, when it may be seen but a short distance above the ground, shining in the twilight glow.

During the last month Venus has been moving very rapidly southward among the stars. By December 5 it will be no less than $24\frac{1}{2}$ degrees below the celestial equator, but on that date it will begin to move northward again, and its northern and eastward motions will conspire to bring it high into the evening heavens and make it a conspicuous object during the early months of 1916.

Mars, though high in the northeast by midnight, does not rise until 9:30 o'clock on December 1 and is therefore just beyond the borders of our evening map. It is moving slowly eastward through Leo and will be seen crossing the handle of the Sickie just above the bright star Regulus. These two bright, reddish objects so near together will form an interesting star figure in the northeastern sky.

Jupiter still shines brightly in the southwest, in excellent position for observation.

Saturn is slowly retrograding through the middle of the constellation Gemini.

are now very widely opened out and it will be found a most beautiful object for study even with a moderately large telescope.

The sun will reach the lowest point of its yearly apparent path on December 22 at 5 hours 16 minutes 16 seconds P. M. (Eastern standard time); this is the instant of winter solstice, after which its northern motion will again begin. December 22 will thus be the shortest day of the present year, this day (in our Central States) being 5 hours 34 minutes shorter than the ensuing night.

Then, too, how wondrous must be the colouring observed by the planet-beings, if such exist, in any one of the not improbable planets revolving round such glorious suns! How grand the fairy spectacle in those belonging to the compound systems, one sun setting it may be in golden yellow, or in purest green, and another rising in amethyst blue or in richest purple. Moreover, fancy can sketch better than words can describe, or an artist portray, the richness, beauty, and variety, of the hues presented, when such charmingly coloured suns, mingling their flashing rays, happen together in the sky.—“The Call of the Stars,” (Kippax).



Some Insects Need Protection.

BY ESTHER M. CUNNINGHAM, WORCESTER,
MASSACHUSETTS.

There is a need for insect protection as well as for bird protection. Butterflies and moths are becoming scarcer each year. The milkweed butterfly, once our commonest large butterfly, is now rare. It is entirely harmless, its food plant being the milkweed for which we do not care. Other butterflies and moths are disappearing. There are several reasons for this. The first is the brown-tail spray. While trying to kill the pests, I fear that we are destroying the harmless and useful insects. To kill the brown-tailed moths the trees are sprayed with poison. The caterpillar eats this poison and dies. The brown-tailed and gypsy moths are fast disappearing. We hear pleasing stories of their decrease, but are not our harmless insects going at the same time? Another cause for the decrease is ignorance. Many of us, when we see a cocoon or a caterpillar, say: "There is one of those dreadful creatures; kill it!" Every cocoon and caterpillar should not be destroyed in the belief that it contains a gypsy moth, a brown-tailed moth or other nuisance. Butterflies and moths have natural enemies. Ichneumon flies attack many species. Birds devour great numbers. These enemies tend to keep insects within reasonable limits, but with our enmity added these creatures have little chance. Many insects are entirely harmless, and some are lovely. We Americans should not become so practical that we shall lose these beautiful and inspiring creatures. Our beautiful night moths are often considered a nuisance; they are especially subject to attack from the ichneumon fly. They are so large, too, that they are conspicuous and so are subject to the attack of birds. For these reasons, they can never become dangerous. Their food is the foliage of the forest trees. The loss

of a few of these leaves cannot harm us. Many persons believe that all moths are clothes moths; the clothes moth is indeed a nuisance, but other moths will not eat woolen cloth. Numberless flowers are fertilized by the aid of moths and butterflies. Many flowers depend upon one kind of moth for their life; if the moth disappears the flower will disappear. Hawk moths are especially adapted to the work of fertilization on account of their long tongue. The tomato worm moth is the commonest of this group. Although this is considered a nuisance, it is rare and does little harm. It too is subject to attack from the ichneumon fly. There are other kinds of flies that scatter pollen. The chief of such insects, however, are bees. Many of us do not realize how much depends on these insects. Take an example from Australia. Red clover was planted for the use of the cattle. The first year it grew abundantly, but the next year it failed. The people blamed the climate. A naturalist solved the problem by planting more red clover and at the same time introducing numerous bumblebees. After this, the clover crop was immense. Our farmers in America would regret to lose their clover, but they would lose it if the bumblebees should disappear. These creatures are becoming less numerous. Dragon flies are useful, because their chief food is mosquitoes. Our common ladybugs make war with plant lice; spiders eat flies; many insects help us in their individual ways. As President Lincoln once said: "Let us give the bug a chance."

The New York Agricultural Experiment Station at Geneva is paying special attention to the study of grapes. Its vineyards now contain 350 native varieties, 50 foreign, and 800 crosses, all in bearing. In addition about 1,600 self-seedlings and 3,500 crosses have not yet come to fruit.

Henri Fabre.

Henri Fabre, whose portrait appears on another page, is dead, at the fine old age of ninety-two years. It is fortunate that he could live so long, for until nearly eighty years old the man whom

illiterate parents. When only five years old, his special bent was indicated in an attempt to find out how the cricket chirped. But he could not take up the investigation of natural history as he wanted to do; he had to earn his living.

Photographed by C. Chassean Flavien, Paris.

HENRI FABRE AND MEMBERS OF HIS FAMILY.

This famous French entomologist and philosopher recently died at the advanced age of ninety-two. He has been called the "Homer of Insects," in recognition of his literary skill in describing the subjects of his lifelong study. Fabre was twice married. His second marriage occurred after he was sixty; two daughters were born of this marriage, and it is understood that they appear in the above picture, at the right, with a daughter by his first marriage at the left.

Cut by Courtesy of "The Outlook."



Victor Hugo described as "the insects' Homer" remained almost unknown to the world. His life had been one of poverty, sacrifice, and struggle, but of superb perseverance. He was born of humble and

and became a teacher of mathematics. This, however, did not prevent him from being a tireless and wonderfully successful observer of insects. He discovered many facts regarding them, and solved

not a few mysteries. He married early in life, and the responsibility of a large family made it imperative for him to work harder than ever at teaching, thus postponing his dream of becoming a naturalist with nothing to do but to study insect life. He was able, however, to make great use of his studies near Avignon, where he lived, because the sun-baked, wind-swept wastes about that town were, if worthless agriculturally, an insect paradise. Here it was that Fabre wrote his greatest work, "Souvenirs Entomologiques," which has now gone into many editions. It was crowned by the French Academy.

Fabre became the friend of Darwin, Maeterlinck, and Mistral. Maeterlinck has said: "He is one of the most profound scholars, purest writers, and finest poets of the century just passed." Through talks with Fabre, Maeterlinck was inspired to write "The Life of the Bee." The poet Mistral rescued Fabre from poverty and obscurity by begging aid from all interested in science.

A recent remark by Fabre illustrates his simplicity and humility:

"Because I have stirred a few grains of sand on the shore am I in a position to know the depths of the ocean? Life has unfathomable secrets. Human knowledge will be erased from the archives of the world before we possess the last word that the gnat has to say to us. Scientifically, nature is a riddle without a definite solution to satisfy man's curiosity. Hypothesis follows hypothesis; the theoretical rubbish heap accumulates and truth ever eludes us. To know how not to know might well be the last word of wisdom."
—"The Outlook."

Where to Obtain Living Pupae

Many of our readers desire to watch the transformation of pupae into moths or butterflies. Such of course know that a butterfly passes through a chrysalis pupa, a moth through a cocoon pupa. We are glad to announce that both kinds may be obtained from Ward's Natural Science Establishment, 82-104 College Avenue, Rochester, New York. Send for their price list and refer to this magazine.

The Harvard College Observatory was founded in 1840 with a total endowment of \$3000. Now, it spends \$50,000 each year.

The Lament of the Drones.

BY GRACE ALLEN IN "GLEANINGS IN BEE CULTURE."

No more?

Not ever ever more within the hive

No more to feel its friendly shelter
'round?

No more to share its pulsing peace, alive
With vibrant hum of motion and of
sound?

And we so powerful-winged and light of
heart?

Of all this life we love are we a part

No more?



"NO MORE."

No more.

Not ever ever more within the hive.

An unimaginable end has come.

The things are turning dead that were
alive

And all the singing voices turning dumb
And Life herself, who one time bade us be,
Has turned away her eyes, which we shall
see

No more.

And this the end?

No end but this for those uncounted days
Of banqueting, or those mad hours of
bliss

We went careening, careless, through the
ways

Of miracle and light? No end but this?
No end but this. No proud sustaining
thought

Of deed with rapture or with patience
wrought—

No end but this.

More and more

The dripping night that stalks without the
hive

Draws round us, dread and ghostly,
grim and stark;
Within, the deepest shadows are alive
With warmth and fragrance, and the
very dark
Dreams day to come. But though the
great sun burns
A million dawns awake, the day returns
To us, no more—no more.

A Remarkable Honeycomb.

It seems as if honeybees at times work purely as a matter of pleasure and for their own education. They then abandon every regular method and become amazingly irregular, as was recently shown in certain tests made to ascertain what they would do on sheets of pure smooth beeswax. When a block of such wax was placed in a hive, the bees probably thought, "As you are doing such an unusual thing, Mr. Beekeeper, we will meet you halfway."

Here is shown their astonishing production. It is unique. The two down-

wardly projecting portions stand out clearly from the sheet of plain beeswax. Around these suspended parts the bees could go freely, as a careful study of the dainty projections makes clearly evident, since they are so transparent that the cells of the other side are visible through them.

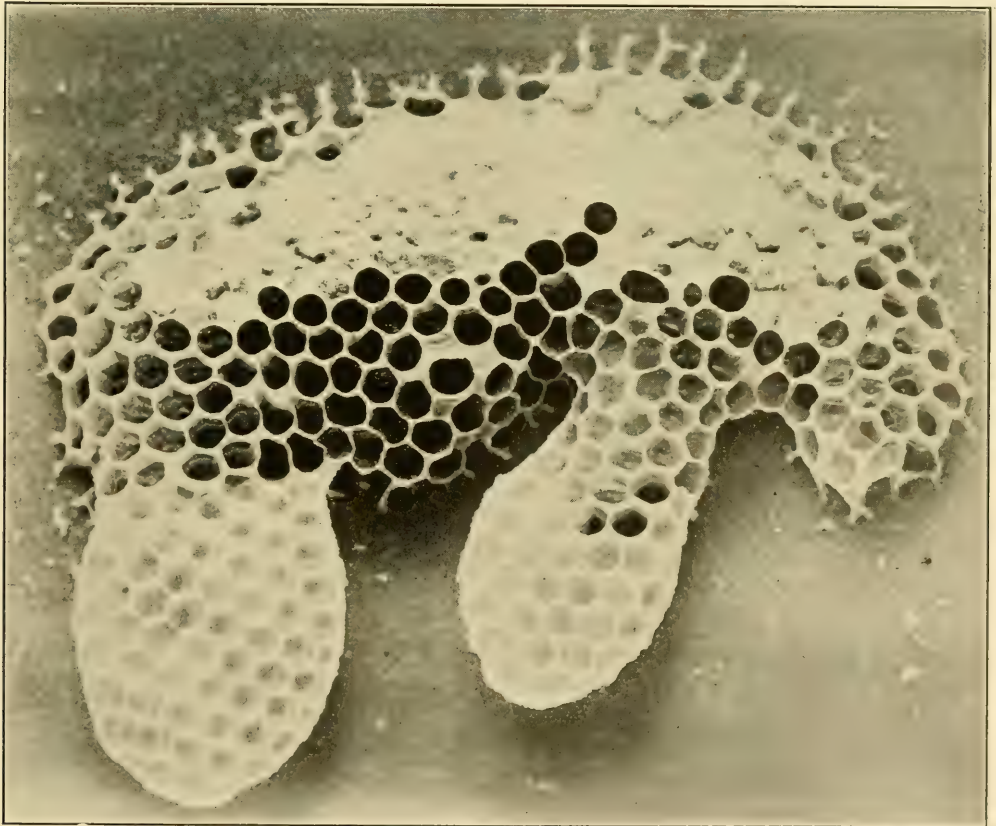
Come Forth

Come forth from your roofs and walls,
Into the woods and fields;
Find out for yourself the delight
A day in the open yields.

Each sunbeam, every flower,
An influence for your good;
But better than all, the cool
Enchantment of the wood.

Therein is balm for your soul,
Therein is rest for your nerves,
Therein the elixir of life,
That bodily health conserves.

Then shatter your prison bars,
And live in God's-out-of-doors;
Put away life's carking cares,
Fill your soul with nature's stores.
—Emma Peirce.



THE REMARKABLE HONEYCOMB.



Additions to our Membership Since Last Publication.

Corresponding:

Miss Edna H. Danielson, Goodhue, Minnesota.

Mr. T. R. Moss, Louisville, Kentucky.

Mrs. Kate Lockwood Nevins, Antioch, California.

Charles C. Adams, Ph. D., Syracuse, New York.

Mr. Edmund J. Sawyer, Watertown, New York.

Mrs. John Hofmeyer, Williamsburg, Virginia.

Mr. W. C. Gray, Tama, Iowa.

Mr. William D. Richardson, Richmond, Virginia.

Dr. George F. Kunz, New York City.

Miss Frances M. Tollett, New Brighton, Staten Island, New York.

L. H. Pammel, Ph. D., Ames, Iowa.

Mr. Lemont Barbour, New York City.

Miss Frances M. Staples, Stockton, California.

Mrs. Estelle Darrah Dyke, Greenwich, Connecticut.

Mr. Osmar Falls Wright, New York City.

Mr. John Franklin Johnson, Greenwich, Connecticut.

Mrs. O. H. Stevens, Marlboro, Massachusetts.

Mr. William Howlett Gardner, Port Washington, Long Island, New York.

Master Charles Casimir Wade, Sound Beach, Connecticut.

Miss M. Inez Lee, Plainfield, Iowa.

Mr. W. W. Lathrop, Warren, Ohio.

Albert Elmer Austin, M. D., Sound Beach, Connecticut.

Mr. Will Webb Tuttle, Muncie, Indiana.

Sustaining:

Mr. Frank La Manna, Brooklyn, New York.

Mr. George Lauder, Jr., Greenwich, Connecticut.

Mr. A. Ramsey, Surrey, England.

Mr. Herbert W. Faulkner, Washington, Connecticut.

Mr. Chas. P. Shoffner, Philadelphia, Pennsylvania.

Mr. Frederic Webster, Darien, Connecticut.

Life:

Mr. Charles A. Bruun, Kansas City, Missouri.

With Our Chapters.

Under the leadership of Mr. Halbert C. Phillips our Glenbrook Chapter has been reorganized and the following officers elected: President, C. S. Hempstead; Vice-President, Alan Arthur; Recording Secretary, Carl Mix; Corresponding Secretary, Arthur Sylvester; Treasurer, Abbot Andrews.

We have added to our list the Seeley Chapter of Stamford and Springdale, and the Ernest Thompson Seton Chapter of the Woodcraft School in Greenwich. The officers of the Seeley Chapter are: President, Mrs. Bertha Gallup Dailey; Vice-President, Miss Sarah A. Ward; Recording and Corresponding Secretary, Miss Sara Crissy Brown; Treasurer, Miss Margaret J. Hutchings.

Of the Ernest Thompson Seton Chapter the President, Treasurer and Corresponding Secretary is Virginia Beresford; Vice-President, Richard Beresford; Recording Secretary, Cecile Dudley; Curator, Wade Dudley.

Events in the Welcome Reception Room.

November 6th: Organization of the Seely Chapter.

November 12th: Camp Fire Girls.

November 13th: Boy Scouts.

November 16th: Organization of the Ernest Thompson Seton Chapter.

Talks by Dr. Bigelow Elsewhere.

November 4th: Waterside School, Stamford.

November 8th: Greenwich Farmer's Club, Greenwich.

November 9th: Woodcraft School, Greenwich.

Miscellaneous Contributions to ARCADIA.

Mr. Stephen I. Clason, Sound Beach: poker for mineralogical fireplace in the Welcome Reception Room.

Mr. John R. Gordon, New York City: block of sulphur from Louisiana mines.

Mr. Arthur Munson, Panama City, Florida: shells from Florida.

Mr. H. E. Deats, Flemington, New Jersey: two pieces of coral and flicker nest.

Mrs. William Siegrist, Sound Beach: portrait of Louis Agassiz for the Welcome Reception Room.

Mr. W. Scott Lewis, Los Angeles, California: three slides for projection by stereopticon.

Miss A. P. Cobb, Sound Beach: terminal bud and stem through center of rose.

Miss Linda Worrell, Sound Beach: large jack-in-the-pulpit.

Mrs. Frederick Gotthold, Cos Cob, Connecticut: unusually large fasciated stem of asparagus—flattened stem three inches in diameter and five feet long; egg with peculiar markings.

Miss Poloma Engle, Sound Beach: *Actias luna* moth.

Mr. Thomas O'Connor, Sound Beach: large mourning horsefly, *Tabanus atratus*.

Miss Natalie Roeth, Stamford: double leaf of wild cherry.

James Byrnes, Sound Beach: specimen of *Corydalis cornuta*.

Mr. Ellis B. Noyes, Portsmouth, Virginia: large herbarium.

Mrs. Charles Engle, Sound Beach: bat from Porto Rico.

John Drenckhalm, Riverside, Connecticut: larva of moth (*Sibine stimulea*).

Mr. Wm. J. Blackburn, Jr., Adena, Ohio: specimen of Calamite or "horsetail."

Miss Helene Edmonds, Sound Beach: string of egg cases of whelk (*Fulgur canaliculata*).

Miss Winifred Stoner, Jr., Wilmington, North Carolina: living specimens

of carnivorous plants—Venus flytrap pitcher plant and trumpet plants and their bloom.

Excelsior Hardware Company, Stamford: burnishing and lacquering candlesticks for the fireplace in the Welcome Reception Room.

Reverend Lewis W. Barney, Ph. D., Sound Beach: decorative drawing of Biblical texts (God's Works).

Yerkes Observatory, Williams Bay, Wisconsin: eighteen astronomical transparencies.

Lick Observatory, Mount Hamilton, California: illustrated volumes of star fields, nebulae, comets, etc.

United States Coast Survey, Washington, D. C.: large chart showing details from Shippan Point to Captain's Island and northward to the railroad.

United States Naval Observatory, Washington, D. C.: "The American Ephemeris" for 1915-1916.

"Everyone to Her Taste"

Heading, of Leading Editorial of **Stamford Evening Star**.

As the sweet young thing said when she kissed her Boston brindle pup.

The visitors wished to see the average life of Connecticut folks so we took the Post Road to Bridgeport.

Cove Pond and Percy's—hospitality, rest, geniality. Then onward through bright, lively, pretty Norwalk; onward, across the bridge (at your own risk)—on to Bridgeport, brilliant in every way; stylish girls and fellows, firm and vigorous movement, vibrant life.

Let us see all of Bridgeport; so the six-cylinder Haynes pauses at the cabaret.

Don't abandon hope, ye who enter, but get on while you are still normal!

Noise! Noise!! Noise!!!

Noisy sounds from the piano; noisy sounds by a good voice that knows nothing of the art of singing, noisy talk, noisy laughter, exceedingly noisy costumes, noisome air and fortissimo marks on the thermometer.

How poor the things that cost so dear! Fresh air is free, stale air costs by the minute. The genial family with its handsome sons and pretty daughters, has the latch string out; the unclean cabaret with its stench and rouge taxes you at the door. Pure water and delicious viands bestowed without

stint by the head of the family; drugged waters and food flavored with sweat at the cabaret, plus the fragrance of stale tobacco, stale alcohol, very stale alcoholics, stale strategems all around.

Oh yes, the people like to be humbugged! For the tables were filled, so were the come-ons—ears, eyes, noses, bellies—with poison, and their pockets rapidly emptying.

Yet neither the poor, pretty, painted girls, nor the gluttonous drinkers were as poor as the man who taxed all for his poor stuff.

Enough. We have seen poverty of soul, poverty of mind, poverty of taste; to-morrow we shall see riches. Back to Stamford.

Up and out into the fresh morning air, past prosperous homesteads and fragrant gardens, glimpses of the sparkling Sound, and we apply brakes at ARCADIA.

"Welcome," says the bright blue sky; "Welcome," say the trees: "come, enjoy our shade;" "Welcome," from the leaf-embowered cottages; "Welcome," say the whole God-blessed clan of Bigelows.

Take your ease, breathe ozone, walk with God, feast your soul.

Forget the poor cabaret, for here is wealth. Strength, love, normality—these are yours without condition or price at ARCADIA.

Stamfordians, you can get the price-less for nothing, or you can buy the worthless by paying out your all.

Everyone to his taste.

But taste can be acquired.

Has Established a Conchological Museum.

Y. Hirase, one of the members of The Agassiz Association, has been a faithful worker among shells for thirty years. He labors for a new ideal along the line of nature study but in the meritorious pursuit he has met with many financial trials. Recently he issued a circular in which he appeals to his American friends, telling the story of his struggles, the great expense for books, papers, magazines and the time that he has devoted to the work. He states that he has consumed half his property and that necessarily his family has lived sparingly. But, good for him, he has been sticking to it and now expres-

ses his determination as follows: "I was determined 'not to look back, as I had put my hand to the plough' nor to leave it off until I should fall down dead."

Every lover of shells will be interested in his circular. Address: Y. Hirase, President, The Hirase Conchological Museum, Okazaki, Kyoto, Japan.

The Astonishingly Powerful Stump Pulling Machine.

That Mr. Seton aided by one or two workmen has been able to uproot such enormous trees, as was explained in our November number, has attracted much attention and elicited many inquiries. At the time of publication of that number we did not know the manufacturer's address, but have obtained it and are glad to present it to our many inquiring friends. Full particulars may be obtained from Walter J. Fitzpatrick, 182 Fifth Street, San Francisco, California.

A man at the handle of this machine can lift forty-eight tons. This is more than can be accomplished by sixteen horses. Is there anything more astonishing in all the realm of mechanical power? The editor, watching the operation of the little machine, realized that it is entitled to its name of the "Wonder Worker."

It will pull any stump that a one inch wire cable will hold. It is built of first-class material, it will last a lifetime, and it is not expensive. Think how convenient this is for any farmer or, perhaps even better, for some local contractor that could easily secure one and do a thriving business among the farmers and others that have need of so powerful a machine. A few farmers could club together and own it in a company and each have the benefit of it. Where in all the world can another machine be found capable of pulling as much as sixteen horses, and needing only one man to control it?

Of Interest to Parents.

"Child Life," published by the American Institute of Child Life, of Philadelphia, Pennsylvania, has been doubled in size and so improved that it is now in true harmony with its name. It publishes much material of interest to parents, and reprints from a large number of magazines suggestions intended to inspire interest among the young folks themselves.

Tragic Death of a Young Naturalist.

On September 21st, only a few days after his eighth birthday, little Robert Walker of Chattanooga, Tennessee, was struck by an automobile as he was crossing the street to visit a candy store, and almost instantly killed. His father is the representative of The Agassiz Associa-

tion for Tennessee and for a long time has taken active interest in the work. He, his son and the other members of his family are good naturalists. The editor expected to visit the family last autumn, but was unavoidably prevented. Under date of October 7th Mr. Walker writes as follows:



"HE HAS THE MAGAZINES UNDER HIS ARM."



"SHOWS HIM FEEDING HIS PET KID."

"I am sorry that you did not know Robert personally. He was a born naturalist, and the most affable, and genial child that ever lived. He never failed to enjoy a beautiful sunset, or a glorious sunrise, nor to try to show others the beauty that was in nature. The plants, the birds, the flowers, everything in nature had a peculiar charm for him. Three hours before the occurrence of the terrible accident that took away his life he was caressing his butterflies, feeding his garden spider, and showing me the spines on the back of an Io moth larva.

"Last fall when we were anticipating a visit from you and when the organization here failed to keep its pledge to supply the funds that were to bring you, it

was Robert and his brother Wendell who at the dinner table said: 'Tell Mr. Bigelow to come; Wendell and I have \$50 in the bank; we will bear his expenses. We want to see him and hear him tell some stories.' I intended to allow him to carry out his wishes, and you will remember that when I wrote you I stated, 'You will be amused when you learn who it is that is putting up the guarantee fund.'

Fill the Mind with Roadsides.

For, if we can fill the plastic minds of growing children with thoughts of the beautiful world of nature, with the fascination of the myriads of wee beauties, more wonderful than a circus, we can so saturate them with the good, that no room remains for the morbid, the undesirable, the vicious. Let us teach them to read roadsides, as well as books.—"The Nature-Study Review."

Nature is so prodigal,
She heaps her treasures up:
If to her we look for joy,
Full will be our cup.
—Emma Peirce.

LITERARY NOTICES

Decorative header featuring a central open book with 'LVX' and 'VITA' on its pages, flanked by ornate scrollwork, floral motifs, and two candlesticks.

NATURAL EDUCATION. By Winifred Sackville Stoner. Indianapolis, Indiana: The Bobbs-Merrill Company.

The author tells in a simple and direct manner just how she educated her daughter, Winifred Sackville Stoner, Jr., from the cradle up to her tenth year. In her choice of topics she has

with Winifred in an extraordinary way by following the laws of a natural education. She contends that there should be schools for mothers rather than for children, and that love combined with intelligence and ingenuity can work wonders in making so-called "dry" studies interesting and valuable. She describes games through which children may



BACHRACH

Miss Winifred Sackville Stoner

SHE AND HER MOTHER ARE MEMBERS OF THE AGASSIZ SOCIETY

been guided by the many letters received from mothers and teachers asking how she succeeded in training her little girl so she could speak several languages and write for periodicals at the age of five years, and yet retain all the characteristics of a healthy, playful child.

Mrs. Stoner shows that she has succeeded

learn to read, write, spell, acquire different languages, and gain a general knowledge of history, geography, physiology and mathematics. And she attributes the remarkable results she has achieved to the help of the "good giants, Observation and Concentration," and the "little fairy, Intense Interest," led by "Im-

agination, mortals' greatest gift," which can "make the pathway of Knowledge one of joy for all children."

FACTS IN JINGLES. By Winifred Sackville, Stoner, Jr. Indianapolis, Indiana: The Bobbs-Merrill Company.

From the educational point of view amid natural methods, one hardly knows which to admire most—the mother that has used plain common sense in her efficient teaching, or the

daughter that has profited by the teaching of so wise and skilled a mother. We are especially glad that both mother and daughter are Members of The Agassiz Association and that they are carrying on their nature work in connection with ARCADIA. Many specimens collected by Winifred are on exhibition in our laboratory. These include living pitcher plants and Venus's-flytraps. These flytraps are found only in Wilmington, North Caro-



Winifred, age three

STANTON EVANSVILLE

lina, so far as has been reported to ARCADIA. Of this remarkable girl, the publishers say in their announcement of her books:

The best developed child in America, Winifred Sackville Stoner, Jr., could speak several languages and wrote for newspapers and magazines at the age of five, and yet retained all of the characteristics of a healthy, playful child.

At the age of nine she passed the college entrance examinations, and now at twelve, she has mastered eight languages, has written nine books, is a teacher of Esperanto, an accomplished musician, and is stronger physi-

cally than the average child of her age.

She is not a genius nor a wonder child, but simply a normal child well developed through a system of Natural education invented by her mother, Mrs. Winifred Sackville Stoner, from whom she has received her training.

Any mother can do for her child what Mrs. Stoner has done for her daughter, if she employs Mrs. Stoner's methods.

Any mother can learn Mrs. Stoner's system from her book, in which she analyzes, outlines and describes her entire plan as carried out during the education of her daughter from the cradle to her tenth year.

Bird Lore for October is a Bird-Club number, with articles on the forming and conducting of bird clubs by Frank M. Chapman, Ernest Harold Baynes, and others. Reports from the leading bird clubs of the country show that some of these purely local organizations have as many as 500 members, and the interest they arouse in Citizen Bird indicates that the bird-club movement is possessed of a far-reaching importance.

INDUSTRIAL AND VOCATIONAL EDUCATION. By S. H. Comings. 1140 Columbus Avenue, Boston, Massachusetts: Christopher Publishing House.

The scope of this interesting book is well expressed in the dedication to all that desire to see the supreme ambition of our civilization turned from the effort to develop things to the development of the highest possible average type of manhood and womanhood; and to all who would see labor spiritualized, and man's creative attribute changed from the ideal of degradation to that of communion with each other, and with the infinite.

The book is of especial local interest since it devotes much attention to Mrs. Johnson's School of Organic Education at Fairhope, Alabama. Mrs. Johnson has a summer school at Greenwich, Connecticut. In the introduction, C. Hanford Henderson says:

"There is a wholesome compromise between this extreme and the other extreme represented by child labor. It lies, I think, in having children do everything they possibly can for themselves, and then every day something of real service for the general good of the household."

CORNELL RURAL SCHOOL LEAFLET. An Issue for Teachers. Ithaca, New York: The Department of Rural Education, New York State College of Agriculture at Cornell University.

Here are nature study and agriculture in delightful combination. "Nature study," the editors say, "is the study of nature. Every boy and girl should be encouraged to find education and resources in the out-of-doors. They should know the wild life about them—the birds, the trees, the flowers, and wood. They should take interest in the weeds, the insects, the animals of field soils, the rocks, the brooks, the hills, the woodlot, the forest. They should learn to love the music of the wind, the sighing of the pines, the clear, true starlights, the restfulness of rains, and the magic of the snows. Love of nature is a valuable asset in the lives of farm folk."

The publication of such a plain, attractive, common sense book on nature study in its relation to farm life is encouraging. There is the absence of that popular and foolish teaching, that a city man can without previous experience remove to a farm and in a few months make a fortune. The book suggests nothing of the kind but does show that in addition to any pecuniary returns

obtainable from a farm, the man adapted by taste or natural inclination to a rural life can be happy in the country, can there give his children proper training and there make them happy. The book is good to look at and, perhaps better than this, it is good to read. Its topics cover a wide range, and are pleasingly treated.

Connecticut and some other states would do well if they should adopt some of New York's methods. The trouble with many of our rural schools in Connecticut is that they follow too closely the methods of city schools and turn the children's attention toward the city. They are too well commercialized and not well enough naturalized.

HOW TO ATTRACT WILD BIRDS ABOUT THE HOME.

By Niel Morrow Ladd, President of the Greenwich Bird Protective Society, Inc., with an Introduction by Charles D. Lanier. Greenwich, Connecticut: The Greenwich Bird Protective Society, Inc.

This book, which includes the First Annual Report of the Greenwich Bird Protective Society, Inc., is extremely convenient and attractive. Its literary form is good, the illustrations are beautiful, meritorious, mechanically perfect, and tell the story in a manner not only instructive but inspiring. Mr. Ladd is doing wonderful work. He deserves and will doubtless receive the hearty support of bird lovers. He is an enthusiastic ornithologist and possessor of the business ability to make that enthusiasm practical. We advise our readers to send thirty-five cents for a copy of this unique and attractive book.

Nature Study Review

Official Journal American Nature Study Society

The numbers for the coming school year will be filled with special articles from practical teachers dealing with actual work, methods and suggestions for School Gardening, Elementary Agriculture, and Nature Study.

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The Nature Study Review

ITHACA, N. Y.

JANUARY, 1916

THE GUIDE TO NATURE

VOL. VIII

No. 8



EDWARD F. BIGELOW, Managing Editor

PUBLISHED MONTHLY BY

THE AGASSIZ ASSOCIATION, ARCADIA: Sound Beach, Conn.

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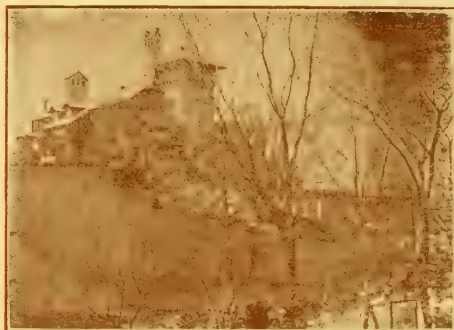
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Nature Needs More Words.

The weather Bureau has sprung a new one. It is the word "smog" and it means smoke and fog. The bureau explains that very frequently there are times when this mixture is apparent in the atmosphere, and it considers the new word a great little idea.

Very well, "smog" let it be, says the Kokomo Tribune. But why end there? Let's call a mixture of snow and mud "smud." A mixture of snow and soot "snoot," and a mixture of snow and hail "snail." Thus we might have a weather forecast:

"Snail today, turning to snoot tonight; tomorrow smoggy with smud."—Country Gentleman.

When Two Fools Met.

Dr. P. S. Henson once delivered his lecture on "Fools" at the New York Chautauqua. Introducing him, Bishop Vincent said: "Ladies and gentlemen, we are now to listen to a lecture on 'Fools' by one—(and the audience broke into a roar of laughter, and, after it had died away, Bishop Vincent added)—"of the most brilliant men in America." Dr. Henson rose, and with a genial smile, said: "Ladies and gentlemen, I am not so great a fool as Bishop Vincent"—(another roar of laughter, after which the speaker added)—"would have you believe."

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Connecticut

Here is a frock that can be made from flouncing and from material with equal success. It is a very charming little model, eminently childlike, yet essentially smart and it can be made with a high or square neck and with either short or long sleeves, so that it seems adapted to many occasions as well as to many materials. When flouncing is used, the hem and tucks are of necessity omitted. Here, the fulness at the upper edge is laid in tiny tucks, but it would be quite possible to substitute smocking and smocking is exceedingly smart and also gives a very pretty effect. On the figure, the frock is made of embroidered flouncing with plain lawn for the sleeves and lace banding used as trimming. In the small front view, it is made of rose colored challis with lace and it makes a very pretty frock suited to the girls of six years of age.

For the 4 years size will be needed, 2 yds. of material 27 or 36 in. wide, 1 3-4 yds. 44, or 1 1-2 yds. of flouncing, 27 in. wide, with 1-2 yd. of plain material 36 in. wide and 2 1-4 yds. of banding.

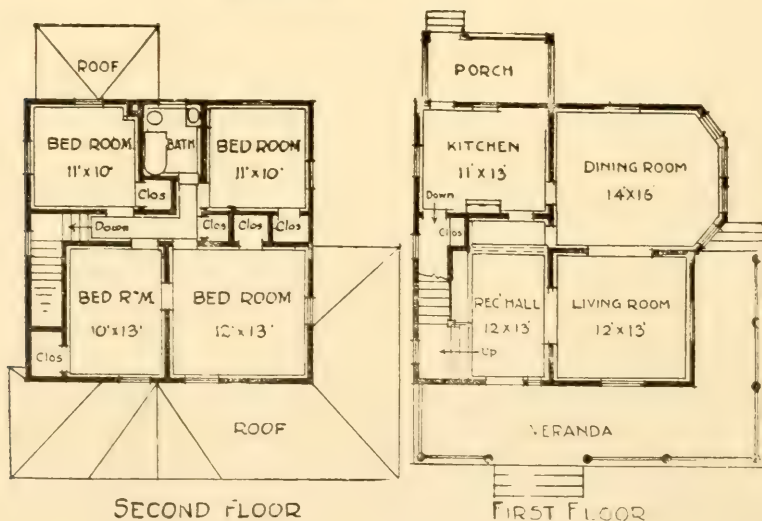
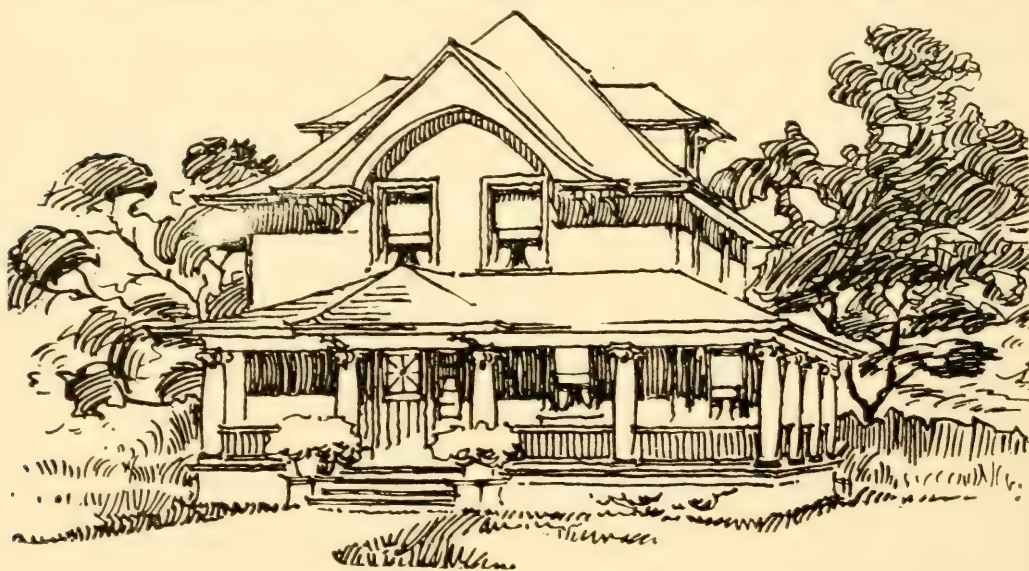


Full Plans and Specifications May be Obtained from
THE GUIDE TO NATURE.

Attractive and Convenient.

The house shown here is a roomy, comfortable one, with wide porches. The reception hall, living room and dining room with bay window are a pleasant,

attractive group of rooms. Kitchen is bright and conveniently arranged. Rear porch. On the second floor are four bedrooms and a bath. An unusually large



amount of closet space is provided.

The cost of this house is given in the items below:

Excavation	\$ 90
Stonework	175
Brickwork	60
Carpenter work	525
Plastering	200
Lumber	550
Millwork	500
Painting and Glazing	250
Plumbing, etc	225
Hardware	100
Hot air heating	125
Range	40

Total	\$2,840
-------	---------

Mail for the Murphys.

A freckle-faced girl stopped at the post-office and yelled out: "Anything for the Murphys?"

"No, there is not," said the postmaster.

"Anything for Jane Murphy?"

"Nothing."

"Anything for Ann Murphy?"

"No."

"Anything for Tom Murphy?"

"No."

"Anything for Bob Murphy?"

"Not a bit."

"Anything for Jerry Murphy?"

"Nothing at all."

"Anything for Lize Murphy?"

"No, nor Pat Murphy, nor Dennis Murphy, nor for Pete Murphy, nor Paul Murphy, nor, John, Jack nor Jim Murphy, nor any Murphy, dead, living, unborn, native or foreign, civilized, savage or barbarous, male or female, black or white, franchised or disfranchised, natural or otherwise. No! there is positively nothing individually, jointly, severally, now and forever."

The girl looked at the postmaster in astonishment and said: "Please see if there is anything for Clarence Murphy."—Truth.

Protest Answered.—"Hang it, Jones, I've just been stung by one of your confounded bees! I demand reparation!"

"Certainly, Bilson. You just show me which bee it was and I'll punish the horrid thing severely!"—Philadelphia Evening Ledger.

Difficulties of Physiology.

Young Arthur had the study of anatomy at school, and had shown interest in the course. One morning at breakfast he asked his mother in grave perplexity, "Mother, I know where my liver is, but where is my bacon?"

Passed.—The excellence of the Creator's work is officially established, as evidenced by the following from a motion picture screen:

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"Approved by the Ohio State Board of Censors,"—Boston Herald.

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A pretty good firm is Watch & Waite
And another is Attit, Early & Layte;
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Walter G. Doty in "Woman's Home Companion."

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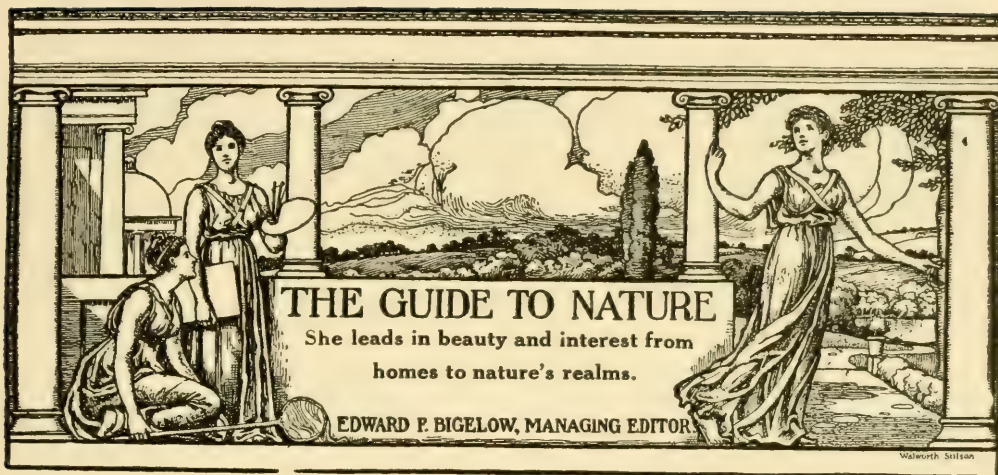
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TELEPHONE CONNECTIONS



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Volume VIII

JANUARY, 1916

Number 8

An Adjoining Institution of Outdoor Interests.

By EDWARD F. BIGELOW, ARCADIA: Sound Beach, Connecticut.

THE Agassiz Association's ARCADIA and the Sound Beach Golf Links lie side by side. The history of the locating of both organizations in this picturesque spot and as next door neighbors has much in common. The reasons for the removal of the organizations to this part of the town are likewise similar. The purpose of each is to afford healthful occupation and to incite an interest in "all out of doors." The real intent of a ramble in the fields and the woods with camera or collecting case, with eyes wide open and mind alert is, in the end, precisely the same as that of knocking a ball across similar fields and artificial obstacles. When we consider prime purposes, we discover that we differ only in methods and not in fundamental principles. Both occupations seek similar results, both demand muscular exercise, and require considerable skill. The joy of photographing a bird or of finding a rare specimen of plant is about the same, I judge, as that of making a certain number of strokes carry a ball to a certain point on the links.

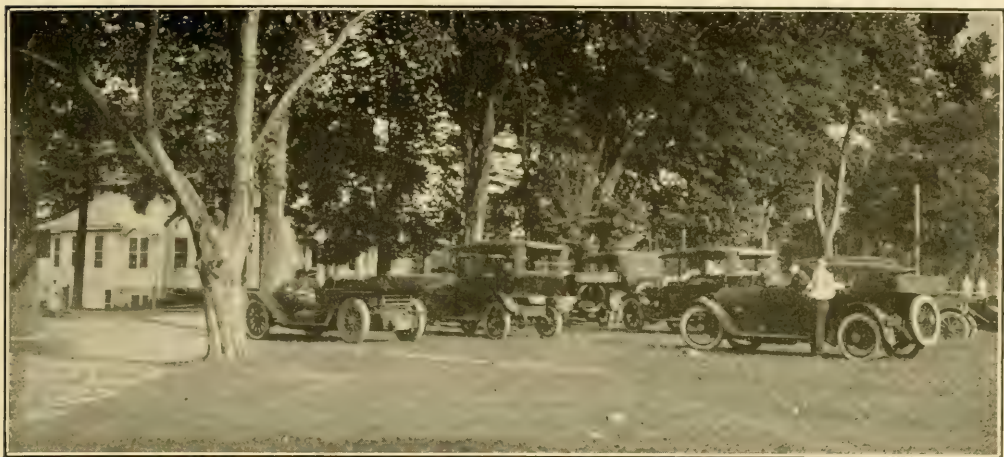
The Sound Beach Golf Links and The Agassiz Association's ARCADIA are exchanging contributors in that each fur-

nishes the other with reciprocal picturesqueness. We recently published in this magazine an account of a land owner in New York that possesses the right of view across the fields in front of his property. In his deed is the restriction that the view from his territory shall never be disturbed, and a pecuniary value is, for perhaps the first time, placed upon a landscape. The Sound Beach Golf Club is contributing definite pleasure to the AA, and is increasing ARCADIA's value. We are trying to reciprocate by improving the appearance of our territory, so as to increase the Golf Club's pleasure in the landscape.

Do these golfers know how really beautiful they are? I am not referring to their personal pulchritude, but to the charm and grace that they add to the landscape. If they were engaged by the day to pose in picturesque attitudes on the rolling green for our satisfaction, they could do no better than they now do without money and without price. Every visitor at ARCADIA, especially those who visit Nymphalia, admires the strong, healthful strides, the graceful poses, the alluring aspect of the golfers as they march over the links, following a ball that leaps in



ON THE SOUND BEACH GOLF LINKS.
Picturesque out of doors for the golfers, and myriad interests in grove and pool for naturalists. For both it is open air exercise that stimulates enthusiasm.



ON HOLIDAYS ALL ROADS LEAD TO THE GOLF CLUB.

mathematical curves before their dexterous blows. Little of this world's beauty is self-conscious; for this it is all the more charming. Do the golfers in their gay costumes on holidays and Saturdays realize how greatly they enhance the beauty of ARCADIA Road as they pass to and fro in their pursuit of a few hours exhilarating exercise? They often look toward ARCADIA—we have been happy to see them do it—as if it were hallowed ground—something admirable, enviable,

desirable next after, perhaps next before, their adorable links, not tangible, only visible, but far beyond their reach.

Once we tried to break the icy barrier by sending a circular of invitation to each of the club members, offering them the nature study facilities of this Institution. We received a prompt reply. Two men, one woman and two boys visited our Institution, expressed great delight with it, and wondered why we had neglected to invite the club members and to let them



NOW WE ARE READY TO SHOW YOU HOW WE KEEP YOUNG AND VIGOROUS.

know what we are doing. It is consoling to know that some faults have been corrected. We are hoping for frequent visits in the future.

Once a golfer, always a golfer, with no leisure time for anything but golf. I admire this club and these enthusiastic people. A thing that is worth doing at all is worth doing whole-heartedly. A golfer would so act if he should take an interest in nature study. We know that such will understand why we at ARCADIA have no time to play golf. I must content myself with a distant view of the links.

presents golf links to people financially less favored. There are thousands of dollars given to keep people indoors, to provide institutions for the care of consumptives, but where is the wise philanthropist that will make golf links available to those less successful in financial matters; A sanatorium for the alleviation or the cure of consumption is a good thing. It is perhaps better to provide spacious and palatial buildings for libraries, Young Men's Christian Associations, Rescue Homes, settlements, hospitals, but why does not some lover of golf who



THE GOLF PROFESSOR GIVING A PRACTICAL LECTURE ON "THE BENEFITS OF INTERESTING OUTDOOR EXERCISE."

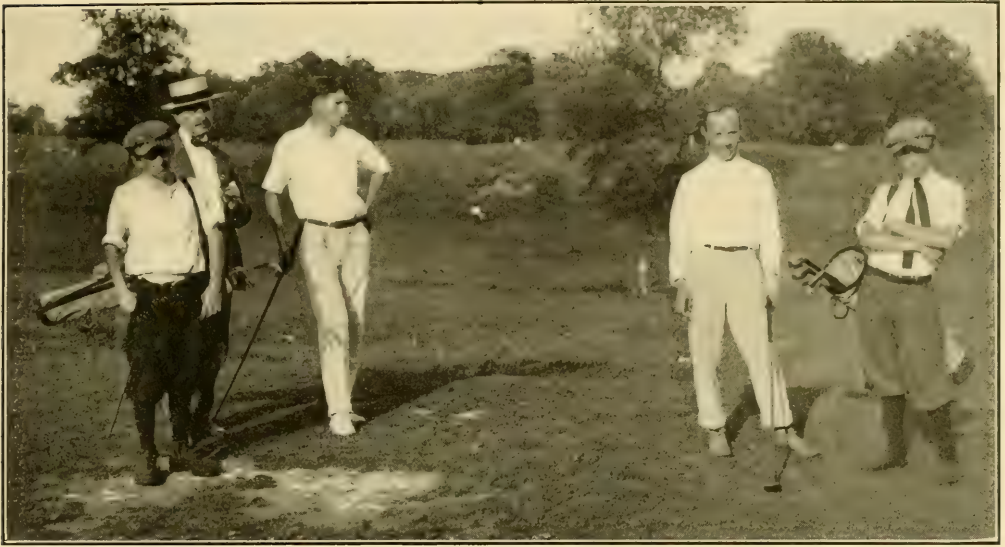
and an occasional visit to these cordial and hospitable people, and I must try not to be disappointed if they do not honor us by rushing to become members, nor by such frequent visits as we should like them to make. There is a zest in the golfer's manner of occupying his spare time in his favorite field, but what shall we say of the astonishing indifference of so many people who make no effort to get into God's outdoors, but confine themselves in stuffy rooms devoted to "the movies" or some other form of entertainment that deprives them of the joys of the fresh air and of the open country?

Exclusiveness is the one criticism that may be made of golfing. This will probably continue until some philanthropist

possesses millions of dollars provide golf grounds for clerks, factory workers, sales people and school teachers? These would enjoy the swinging of golf sticks and the exhilarating walk across the links.

I realize that some people will never take an intellectual interest in nature. They may go a-fishing or fill a basket with mushrooms, under the delicious hypocrisy that they are seeking something for the table when in reality their own heart is, maybe unconsciously, seeking contact with the heart of Nature. They need not be ashamed to confess it. The things that touch the inner life are often reluctantly admitted. They need not be. So to confess is an honor.

The Sound Beach Golf Club may have



STUDENTS IN THE GREAT COLLEGE OF MOTHER NATURE.

full credit for developing muscles, perhaps even for developing the links more successfully than The Agassiz Association accomplishes its chosen labor, yet ARCADIA cannot but feel a superiority because it is at least trying to reach and to help all classes while the club is necessarily restricted, and perhaps reluctantly exclusive. The average golf club says, "Keep off the grounds; the heels of your shoes cut into the turf." They also must necessarily say, "You can't join our club; you are not rich enough." They say

these things regretfully, and we are disposed to refrain from what may be considered intrusive. We should like to be better acquainted with our golfing neighbors, and to have them get better acquainted with the fundamental principles of the AA. We do not expect that they will come bodily into our field any more than we expect to go bodily into theirs. They run over into Nymphalia at times, and into the Agassiz Grove occasionally, to get a ball. When they do that, can't they stop and investigate the fundamental

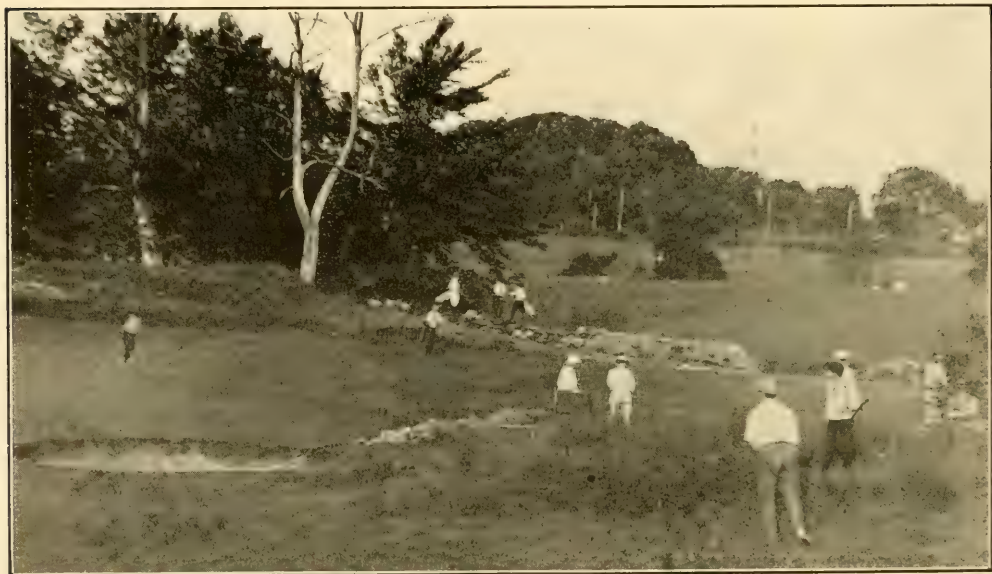


"FOR THEY ARE JOLLY GOOD FELLOWS, WHICH NOBODY CAN DENY."

principles of our Association that they may extend their activities, and ours, too, still further, and so reach all classes of people? Take this thought, Mr. Golfer, and knock it around for a while, and travel with it up hill and down as you travel there with your golf ball. We beg for money to extend our work, so that the poorest child, the most uncultured man, the most ignorant human being, may have the benefit of it as well as our members in private schools and in technical universities. ARCADIA is happy to have you next door. As an institution you do well, but as an *Institution* we are doing better. Please do not keep all your joy to yourselves. We do not keep all of ours to ourselves. Some millionaire golfer who desires to leave a monument to himself and for the benefit of humanity may set a good example to others by taking the lead and establishing a golf club that shall be as open to membership as is a Young Men's Christian Association or a public library, and as general in scattering benefits as are hospitals and settlement houses.

I have heard that some members of the golf club think The Agassiz Association is a little too persistent in its efforts to secure money, and in expecting everybody to be interested in its work. The criticism may be just. Good Mr. Golfer, here and elsewhere extend your own fields in your own way, but burn this fact into your

memory, learn this one truth—we extend our interests, we shall continue to labor by day and by night to extend our interests so as to bring the joys of nature to everybody, old or young, rich or poor, black or white. We are not exclusive. We cannot be. We would not be if we could. You are so because the nature of your favorite pursuit compels. You have no choice. It is that or nothing. All those that I have mentioned would enjoy golf, but they cannot. This is not their fault neither is it yours. We have carried Nature to the slums of New York, and you could carry your interests to thousands, along precisely the same lines, by purchasing grounds somewhere in the country to which the boys of New York City might go to play their childish golf, as your caddies play theirs in your absence, and on your grounds. There are boys and girls, men and women innumerable who would like golfing as well as you like it, and I am sure that you would enjoy your golfing better if you will provide free golf grounds for those that cannot afford to pay for them. A golfer is a royal good fellow, and his female companion too is a royal good fellow. She is as full of zeal as the other good fellow. She follows the ball with as much zest, and she appears to be as fond of the exercise, the out-of-doors movements and the application of her skill as is the more robust player of the other sex.



DO THESE GOLFERS REALIZE HOW MUCH OF CHARM AND GRACE THEY ADD TO THE LANDSCAPE?



AT HEART THEY ARE REAL ARCADIANs AND LOVE CORNFIELD DECORATIONS.

We are learning from the Sound Beach Golf Club. We enjoy their presence as next door neighbors. We hope that this benefit may be reciprocal. We have received good things from them. We acknowledge that they are doing much in the outdoor air of this Arcadian territory. We acknowledge that they are representative of good principles. We should like to have these golf players run over the walls out of their fields and into our fields occasionally, to examine some of the fundamental missionary principles of The Agassiz Association that may be applied as well to golfing.

Lightning Kills Fish in a Creek.

BY FRANK B. HOPKINS, NORTH SALEM,
INDIANA.

In a recent thunderstorm, a dead elm about fifty or sixty feet high and overhanging a long pool in Eel River, here only a rod or two rods wide, and about a mile and three-quarters north of this place, was struck by a tremendous bolt. The current followed the tree to the "elbow" where it turns to grow erect, and there left it for the river after considerably shattering the trunk. The pool is some rods in length and is a favorite spot in which to fish for carp and crappie, which, with black bass, calico bass and white suckers, are plentiful here. After the storm two families that live nearest the pool went to see the stream and, noticing the dead

fish, began to gather them, as they seemed but recently dead. Investigation showed the riven tree and the point where the bolt had left it. The fish were found on the bars and in patches of saw grass and water willow for a distance of more than half a mile. One family gathered a bushel of them.

"How to Make an Eugenical Family Study" is the title of one of the latest bulletins of the Record Office at Cold Spring Harbor, Long Island, New York. It should interest not only persons concerned with family genealogy, but also all who take the naturalist's attitude toward problems of human nature.

Heed the Call.

The out-of-doors is calling you
Give heed unto its voice,
And ever after you will have
Good reason to rejoice.

For energy, vitality,
Sound health are in its keep,
Abounding spirits through the day,
At night refreshing sleep.

If these were held for ransom high,
Far sought would be the gain,
Yet they come knocking at your doors,
And often knock in vain.

Let wisdom guide you through the year,
To spurn would be a sin,
And when you cannot get outdoors
Why, let the outdoors in!

—Emma Peirce.

The Vegetable Sheep of Peru.

A very curious plant growing in Peru is known by the natives as "Yareta" or "vegetable sheep."

"The plant grows abundantly among rocks at high altitudes along the Andes of Bolivia and Peru, where it constitutes a conspicuous feature in the landscape because of its peculiar manner of growth in developing the so-called 'polster' or cushion formation. Similar compact masses of plant growth are frequently found on high mountains, as well as in arctic and antarctic regions."

The size and general appearance of this big plant are shown in the illustrations borrowed from the "Missouri Botanical Garden Bulletin," Plate I

being made from a photograph taken by Professor Bailey on Mount Chachani, near Arequipa, at an elevation of fully 17,000 feet above sea-level.

"It forms hillocks or small mounds often becoming three feet high and sometimes several feet in diameter. Moreover, the entire mound is made up of a single plant, not of a colony of individuals, and it attains this enormous size and extreme compactness by a process of repeated branching (Plate 2), so that the ultimate branches are closely crowded and the outer surface is continuous (Plate 2). The flowers of the Yareta are very tiny, only about two millimeters, or less than one-eighth of an inch long, and are borne in small sessile, axillary, involucrate clusters near the tips of the



TWO MOUNDS OF YARETA GROWING ON MT. CHACHANI, NEAR AREQUIPA, PERU.



FRAGMENT OF YARETA. ABOUT NATURAL SIZE.

This cut and the one on the preceding page are lent to us by the "Missouri Botanical Garden Bulletin."

branches; and the fruit is somewhat like a miniature caraway seed."

A correspondent says that it is "brought down to Arequipa by the car load and forms the principal fuel of that town."

The Dangers of Vulgarly.

The chief peril to which American children are exposed is not immorality but vulgarity. The Outlook has already painted out the various ways in which sound taste and healthful views of life in children are assailed by the Outlook.

so-called "Comic Supplement," many of the movies, and a good deal of the current literature written especially for them. Americans are extremely alert in some ways and extremely dull-minded in others. One of the most severe comments ever made upon the country was the statement that it has ruthlessly cut down its noblest forests to furnish the material on which the sensational newspapers are published. It has felled its forests to spread vulgarity, exaggeration, and cheapness throughout the whole country.—The



The Seeds of Potatoes.

BY EDWARD F. BIGELOW.

Thirteen years ago I originated the annual summer school of nature study at the Connecticut Agricultural College, Storrs, Connecticut, and was the director of the first session. One of the members of the staff at that session was Professor Gully, the horticultur-

five dollars, but I wanted the satisfaction of proving that the professor was in error. Potato balls? It seemed only yesterday that I saw them lying on the ground by the quart, the peck, the half bushel! Potato balls? I remember hurling them from the end of a sharp stick with almost the accuracy of a catapult.

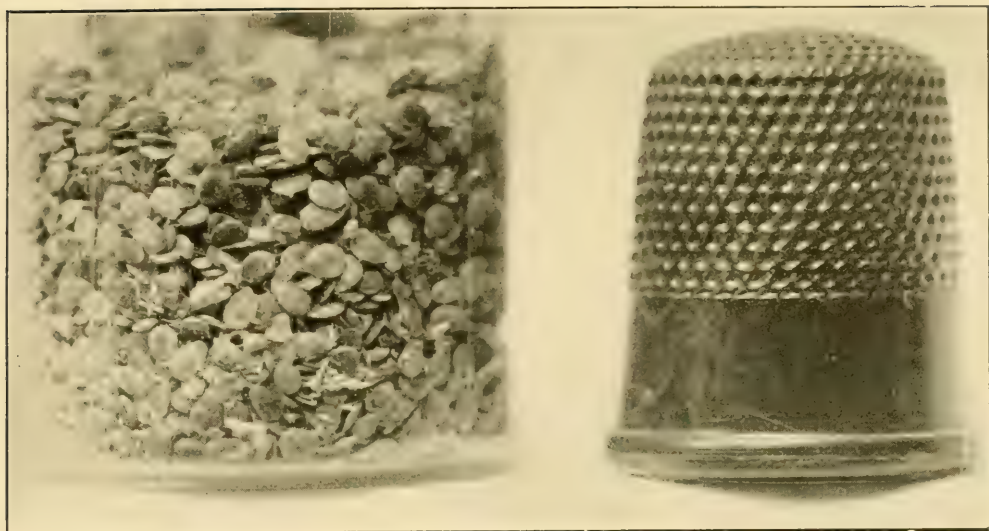


AN ATTRACTIVE CLUSTER OF POTATO BALLS. "LOOK LIKE GREEN TOMATOES."
Photograph by courtesy of Luther Burbank, Santa Rosa, California.

ist of the college. This expert in garden products made one day an astonishing statement that I thought was intended to be oratorical rather than literally financial. When discoursing in regard to the fruiting berries of the common potato, he exclaimed, "All these berries have disappeared from the state. I will give twenty-five dollars for one found within Connecticut."

No more of that lesson that day for me. I did not expect to receive twenty-

I slipped out of the classroom and hastened to the nearest potato patch. Over an acre of ground, up and down between the rows I traveled, but if the prize had been one hundred dollars I should have received it not. No potato balls were there. Still, I was determined to show Professor Gully that he was wrong. When I returned home I hunted in my garden and in the gardens of other people. I haunted potato fields and searched acres. I

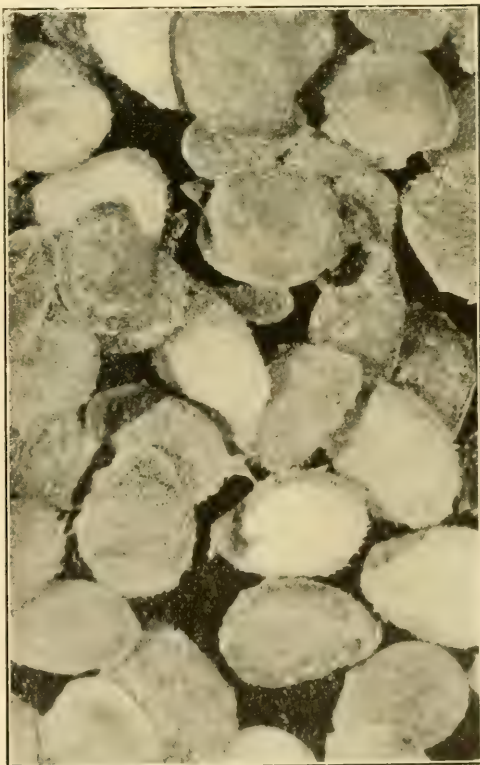


AN ENLARGED VIEW OF A THIMBLEFUL OF POTATO SEED, NOW AT ARCADIA, THAT COST OVER SIX DOLLARS.

invited others into the work. I talked about it from the lecture platform in various parts of the state. At last came a letter and a package. "Here, Mr. Bigelow," said the letter, "are fifty dollars' worth. I found these two in hunting over an acre of potato patch and I send them to you. Collect fifty dollars from the professor. You keep twenty-five. That will be fair to both." With high anticipations I unwound the fastenings and removed the cover of that box, but how dissimilar to those great, round, smooth, tomato-like forms so familiar to me, just a few days ago, as it seemed, in boyhood's familiarity with the potato patch! These were vestigial berries no larger than peas! So for thirteen years I have searched in vain to prove that Professor Gully is wrong, but he must still limit that claim to Connecticut, although it would not cost him a fortune should he extend to the United States in general.

From the lecture platform in Teachers' Institutes in Ohio, Indiana and Pennsylvania I have told the story of that startling announcement, and in most places I have offered a year's subscription to this magazine for a box of well-developed specimens. Last August I made the offer before more than two thousand teachers of Allegheny County at Pittsburgh, Pennsylvania, and again in one of the country districts of southern Indiana. The announcement was received with gen-

eral surprise and the remark, "We can send them to you by the bushel. We will bankrupt you on subscriptions." But of the thousands of teachers that promised to search the fields only about a dozen have responded, and no package contained more than eight or ten balls. Nearly all have been



THE POTATO SEED STILL FURTHER ENLARGED.

vestigial. In the thirteen years not more than thirty large, smooth, round, perfect specimens have reached me. As a result of my efforts during the past summer, I have obtained at a cost of six dollars less than a thimbleful of the seed.

Now the question is, "What is going to happen to the potato crop when no more seed is obtainable?" Most readers know that what we call the planting of seed potatoes is the planting of pieces of potato to raise a new crop; it is really but a sort of cutting as one might cut twigs of willow and set them in the ground to produce new trees. Like grafting it produces its own kind.

But when we plant potato seed it is like planting apple seeds for we do not know what will happen. The seeds seem to become insane and try to produce a little of everything. Fortunate is the experimenter that finds in the varied potato seedlings some particular form that may be better than the original. I long ago gave up all attempt to attain fame and fortune by originating an Early Rose or something equally epoch-making, but I find it interesting to experiment with the seeds and I get kaleidoscopic effects that most conspicuously manifest themselves about the second or third year.

These investigations have led to efforts to ascertain where in the United States the seed may yet be obtained. I have found a few in western Pennsylvania and a few more in West Virginia, but perhaps the best in the vicinity of Jefferson, Ohio.

We request the reader to inquire among the farmers and ascertain to what extent these balls may now be obtained. Here is an extremely interesting nature topic, and the interest of which is not lessened by the fact that it is utilitarian.

Gray's "Field, Forest, and Garden Botany" merely says under *Solanum tuberosum*, "Berries round, green." Much of interest remains unuttered in those three words. The history of the potato itself is of great interest. The most extensive research leads to the conclusion that the potato was not found anywhere on the North American Continent before the arrival of Europeans. Dr. Asa Gray and other prominent investigators have reached

that conclusion. The potato was known to the aborigines and was found under cultivation in the eastern part of South America, on the heights of Guiana and Brazil and in Chile.

* * * * *

A number of correspondents have told me that Luther Burbank of Santa Rosa, California, "has plenty." Mr. Burbank throws the will-o'-the-wisp clear across the continent to Maine and writes:

"The reason for the scarcity of potato seed is that the potatoes have been grown from cuttings so long that it has given up its habit of going to seed.

"It is somewhat difficult to obtain potato seed, but you can probably obtain it from some of the nurseries or seed houses in Maine."

Many other correspondents explain that the matter is very simple and wonder why any one should even raise the question. "You can get all you want away 'down in Maine.'" So, up on the map but "down" in common parlance, to Maine we go. Here is what the Department of Agriculture of the State of Maine says:

"I do not know of anyone at present who is experimenting in growing potatoes from seed. The season has been so bad here in southern Maine that I have not seen any mature seed bolls. I have some at home in a little vial, probably several hundred. These are several years old and I do not know whether they would germinate or not. They are either from the Norcross or Clyde both of the Green Mountain type and both very fine potatoes. I have used them for that reason in my own breeding work. I can send these to you, if you desire, and will make no charge for them as I am not certain they will germinate."

We have accepted the offer of a few of these "*several years old*" seeds. You see how plentiful they are away "down in Maine."

The more extensive the correspondence the more one is inclined to agree with the great Dreer seed house of Philadelphia when it writes:

"We regret to say that we are unable to furnish you with the potato balls and do not know any source of supply for seeds."

Readers, this is an alarm cry! Potato seed is going from this country. There is yet a little to be obtained. All that

can be obtained should be put at once into the hands of competent experimenters.

What are we going to do when the present varieties of potatoes have "run out," and no more seed can be obtained?

**United States Department of Agriculture,
Bureau of Plant Industry, Washington, D.C.**

Potato seed balls are frequently developed on potato plants grown in northern latitudes. It is not at all uncommon to find a considerable number of seed balls on potato vines in Aroostook County, Maine. Neither is it uncommon to find them in northern Michigan and Wisconsin. I have also seen them in a fair degree of abundance in Greeley and Carbondale, Colorado. Occasionally on certain varieties, they may be developed quite abundantly in this section of the country. We have a collection of South American varieties growing at Highlands, North Carolina, which I hope to harvest this coming week that I am sure will supply us with a considerable quantity of seed balls of which I shall save a few for your special use. On our seedlings of some of our variety collection grown at Presque Isle, Maine, this season, it would have been possible to collect them by the half-bushel. Unfortunately, I did not have your letter at that time and so did not save any.

The reason that seedballs are developed more frequently in northern latitudes is that in a colder and moister climate the potato plant reaches its optimum development and, under these conditions they more frequently produce seed than under more unfavorable ones.

The reason why more seed balls are not developed is due to the fact that the plant fails to produce viable pollen,—that is, pollen that is capable of germination. Whenever a variety is grown that normally produces good pollen in abundance one is almost sure to obtain seed balls—Wm. Stuart, Horticulturist.

The meeting last September, at Geneva, of the Swiss Society of the Natural Sciences, which corresponds in that country to our own A.A.A.S., was the hundredth anniversary of the Society's foundation.

The Shooting of the Pigweed.

A purple specimen from the Amaranth family in which are included our green pigweeds as well as the tumbleweeds was left at ARCADIA by Mrs. G. Fred Farnham, Sound Beach, Connecticut, who found it in her garden in the autumn. A lady in the office at the time said: "Isn't that beautiful! I know what it is. It is some member of the Celosia family." The name *Celosia* brings to mind the old-



A SECTION OF THE PURPLE PIGWEED.

fashioned coxcomb of variegated colors, more commonly purple. This sudden identification would not seem so far out of the way if one were to depend on a casual glance at the beautiful color. But the botanists as well as a little careful observation classify the specimen far from *Celosia* and list the plant as *Amaranthus paniculatus*. Britton and Brown's botany describes the seeds as follows: "Fruit an ovoid or oblong utricle, circumscissile, bursting irregularly." The seeds are tiny, shiny and black and are shot out to an astonishing distance. The specimen was placed on the table in the laboratory and allowed to remain there for three or four days. While examining it, the seeds were seen to shoot out, some of them to a distance of nearly a foot,



THE SOCKETS AFTER THE BALLS HAVE BEEN FIRED.

but the plant failed to do its long distance work under human observation. In a day or two a large number of the seeds were found at much greater distances—some even forty inches away.

The seeds are almost as large as the thin walled pods, but what pent up power must be in these tiny fragile capsules that throws these little cannon balls to such a distance.

I have read of an enthusiastic botanist who says that even a garden weed may be extremely interesting. In many cases weeds are more interesting than rarer plants. They have a persistence and a perseverance that are commendable when we look only at those characteristics but annoying when we try to displace them by other and more desirable plants. Any plant that grows where we do not want it to grow becomes a weed. It is not the plant's fault.

We commend, especially to our younger readers, this purple pigweed and other members of the family, though I must confess that the purple plant is rather more aristocratic and more beautiful than the common green pigweed.

Sunbeams and raindrops, the rustle of the breeze,
Flower-petals, green leaves, the welcome shade of trees,
Falling water, bird notes, and things such as these,

Are in Nature's alphabet the A. B. Cs.
—Emma Peirce.



THE BALLS AND THE CAPS.



THE BEEFSTEAK MUSHROOM IS WELL WORTH CAREFUL CONSIDERATION.

The Beefsteak Mushroom.

BY H. W. WEISGERBER, SALEM, OHIO.

Of all the numerous nature subjects there are none that I more thoroughly enjoy photographing than the fungi. Many of these are difficult subjects. This is one reason why so many of the older books upon mushrooms have such poor pictures.

The beefsteak, *Fistulina hepatica*, is one of the difficult forms, for not only is it reddish in color, but it is practically smooth on the top as well as on the underside, as shown in the upper left-hand corner of the illustration.

The "flesh" of this fungus is fibrous and follows the outline, as shown by the section in the upper right-hand corner.

The large specimen at the lower edge of the picture grew on an old chestnut stump; the two smaller forms, as well as the one "sectioned," and the one turned bottom side up, were gathered elsewhere to complete the picture of the species.

The inside is red. The watery juice resembles thin blood and has an acid

taste. The gourmand who loves strong vinegar on his beefsteak would enjoy this "sour" fungus, which when prepared is said to resemble beefsteak in flavor—but I failed to find it so when I tried one. But as I have not yet acquired a liking for the fungi, I am not a judge. But mushrooms make fine negatives. For that reason I delight to study and to photograph them.

Our moment of life costs many hours, hours not of business, but of preparation and invitation. Yet the man who does not betake himself at once and desperately to sawing is called a loafer, though he may be knocking at the doors of heaven all the while, which shall surely be opened to him. That aim in life is highest which requires the highest and finest discipline. How much, what infinite leisure it requires, as of a life-time, to appreciate a single phenomenon! You must camp down beside it as for life, having reached your land of promise, and give yourself wholly to it. It must stand for the whole world to you, symbolical of all things. —Thoreau.

TO KNOW THE STARRY HEAVENS

The Heavens in January.

BY PROFESSOR ERIC DOOLITTLE OF THE
UNIVERSITY OF PENNSYLVANIA.

This, the first month of the year, is a month crowded with matters of interest to those who watch the skies. It is in this month that the beautiful Leo, the last of

southeast in the twilight glow after sunset; and also the very bright little Mercury, which attains its farthest entrance into the evening heavens toward the end of the month, it will result that every one of the five naked eye planets are to be seen during the early evenings of the present month.

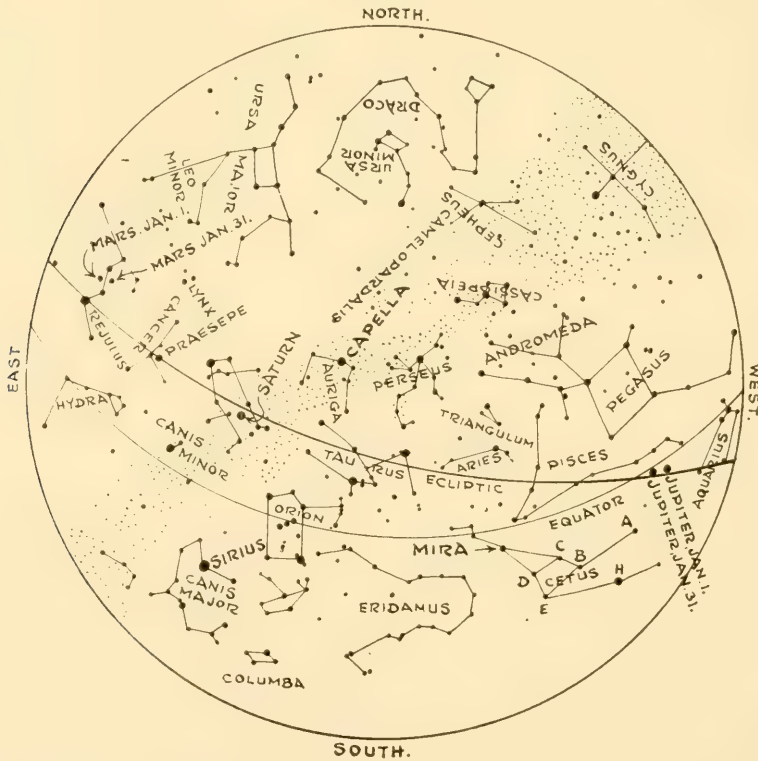


Figure 1. The constellations at 9 P. M., January 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

the winter constellations, has entered the evening heavens, so that the whole south and southeast are now covered with the brilliant winter train of stars. And more than this, we now have the unusual spectacle of no less than three bright planets—Jupiter, Saturn and Mars, all shining in our evening sky at one time. Indeed, if we include the very beautiful Venus, which is now the most brilliant in the

Besides this wealth of interesting objects presented for our study we will also in the early morning of January 20, witness an interesting partial eclipse of the moon, while, (most interesting of all to an astronomer) the wonderful variable star, Mira, is seen shining in the south-west, and this object will during the present month pass through its epoch of maximum light.

While so much occurs of special interest we will have but little space to write of those heavenly objects that are with us for a longer time. The possessor of a small telescope will not fail to remember, however, that the great nebulas of Orion and Andromeda, the Praesepe, the Pleiades, the Double Cluster in Perseus, and the stars, Sirius, Regulus, Capella and the blood-red star in Lepus, are now all in excellent position for observation.

after attaining its greatest brilliance it will rapidly fade away, and soon there will be no trace of any object in this part of the heavens, unless a telescope is employed. As with many variable stars of this kind, it may be continuously followed with telescopic aid, and as it grows fainter will be seen to become a deep red color.

Mira is a great sun which is usually fainter than the ninth magnitude. At an interval of about every eleven months,

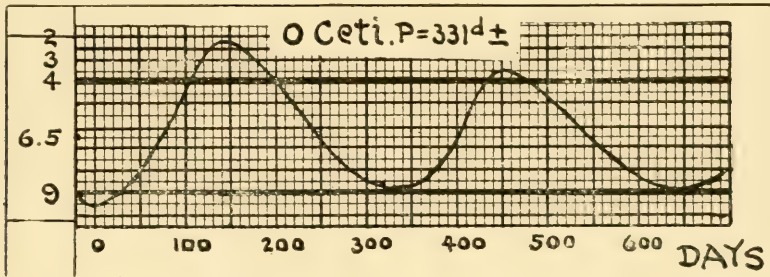


Figure 2. Curve showing the variation in the observed magnitude of Mira through two periods, or during an interval of about twenty-two months. During recent years the maximum brightness has been slightly greater than even the first (high) maximum here shown.

The Variable Star, Mira.

This wonderful and interesting object will be found in the position indicated in Figure 1. If the observer will face toward the southwest in the early evening he will probably have but little difficulty in finding the quadrilateral formed by the four stars, B, C, D and E, which at this time are past the meridian but are still well up from the horizon. These four stars, together with either the star at A or the two stars, A and H, form the figure of a small inverted dipper.

If now a straight line be imagined drawn from E to D, and extended upward, it will almost meet the star at F, which star is Nodus, the knot in the cord which binds the two Fishes together. It is just below this star that there now shines out the wonderful Mira. A few weeks ago, had the observer looked at this part of the heavens, he would have seen no trace of this star with the naked eye.

All of the stars in this region of the sky are unfortunately rather faint ones—it is the extreme eastern border of the faint, summer heavens, but it is hoped that from the above directions the reader will be easily able to locate this variable star. If he will look at it from time to time as the weeks go by, he will see that

however, some stupendous disturbance begins within it and the amount of light and heat which it pours out begins rapidly to increase, until within a few weeks it becomes thousands of times as great as when the sun was quiescent. Sometimes, for many years, Mira has only brightened to a faint star of less than the fourth magnitude; in other years it has risen to nearly the first magnitude, and it is reported that sometimes for many years consecutively it has not grown bright enough to be seen with the naked eye.

The present maximum is due to occur on January 8, but as the interval between brightenings is for some reason quite irregular, the date may vary even so much as a week or two from this. Nor can we predict exactly how bright Mira will grow; but since, during the past few weeks, its brightness has increased an hundredfold it is probable that the present brightening will be a notable one. The magnitude of the star at B, Figure 1, is 3.6; that of the star at C is 3.8; of D is 3.9; of E is the 3.6, and of F is 4.0. Mira will certainly become conspicuously brighter than any of these stars and it will probably exceed even the star at H, whose magnitude is 2.2. It will probably become when brightest from three to six

times as bright as the Pole Star. As to the cause of this wonderful periodic disturbance in this distant sun, we are as yet in complete ignorance.

* * * * *

The Partial Eclipse of the Moon.

The interesting eclipse of January 20 unfortunately occurs at so late an hour of the night that it will probably only be seen by those of us who are so interested in astronomy that they will make a spe-

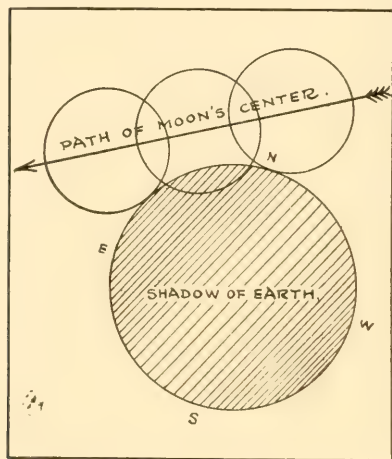


Figure 3. The partial eclipse of the moon on the morning of January 20th.

cial effort to observe it. The eclipse is also a very partial one, only about one-seventh of the moon's diameter being covered by the shadow.

The great shadow of the earth, which always stretches out into space in a direction exactly away from the sun, has the form of a great cone whose base is the earth and whose length is no less than 857,000 miles in diameter.

Figure 3 shows this portion of the shadow, and also the motion of the full moon as we will view it on the morning of January 20. Our satellite will reach the position A and the eclipse begin at 2 hrs. 55 min. A.M., (Eastern Standard Time); it will reach B and the eclipse will be the greatest, at 3 hrs. 39 min. A.M., and it will finally reach C and the eclipse terminate at 4 hrs. 24 min. A.M.

The entire phenomenon will thus last 1 hr. 29 min.; but it will be noticed that even when the eclipse is greatest it will only be a small portion of the lower edge of our satellite which is hidden from us. Throughout the eclipse the moon will be seen high in the sky, in the beginning it

will be about three hours past the meridian, and at the end it will be about one-third the way up from the northwestern horizon to the zenith.

* * * * *

The Planets in January.

Mercury will attain its greatest distance east of the sun on January 20 and for a few evenings before and after this date it may be seen shining brightly in the twilight glow, low in the southwest for a short time after sunset. It will pass to the west of the sun and become a morning star on February 5.

The observer may have noticed how very brilliantly the beautiful planet Venus has been shining in the southwest, just after sunset. For many weeks past, and also throughout the present month, it continually moves northward among the stars, and is therefore seen continually creeping from the south to the west point of the horizon. On January 1, it sets in the southwest about two hours after sunset; by January 31, this time is increased to two and one-half hours, and the planet sets almost due west, having by this time become a conspicuous object in the early evening sky. Venus will remain with us throughout the winter and spring, increasing in brightness and mounting higher in the sky on each successive evening. It will reach its greatest distance east of the sun on April 23, (when it will remain in the western sky until nearly midnight) and it will attain its greatest brilliance on May 27.

Mars will be a most interesting object for observation during the present month. Its very rapid, direct motion which for so long a time has kept it beyond the borders of our evening star map, will cease on January 1, at 9 P.M., and from this time until March 22 it will move westward among the stars. During January it will be seen in the constellation Leo, just within the blade of the Sickle. This most interesting planet is now in almost the best position for observation of the entire year. It reaches its least distance from the earth on February 9, and throughout the month of January the earth and Mars are so unusually near together that the planet can be studied to the greatest advantage. The reader may remember how faint the Red Planet looked only a few months ago. It has now approached

so near us that on January 1 it will shine with three times, and on January 31, with six times the brightness of a first magnitude star.

Jupiter is still well up in the evening sky on January 1, though by the end of the month it will have passed beyond the borders of our map. Saturn is high in

It may of course be that the writer, a certain Benjamin De Casseres, does not intend this to be taken seriously since he says that the name of the new sun-planet is Nietzsche, but most readers would accept it as a new discovery. Professor Eric Doolittle makes this general comment regard-

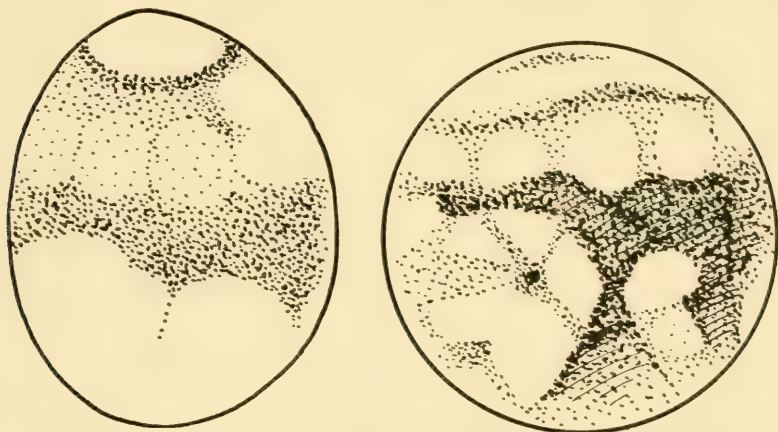


Figure 4. Drawings of the planet Mars. The planet is now opposite the sun and therefore now appears fully as in the second drawing.

the southeast in the constellation Gemini, and daily approaching nearer the meridian. Both of these planets are now in excellent position for observation and study.

On January 2, at 8 A.M., our earth, in the course of its yearly path, will pass nearest the sun. Our sun will then be more than three millions of miles nearer us than when the two bodies are farthest separated in July.

Foolish Astronomy.

It seems easy to deceive the public along astronomical lines, because the public has so little general knowledge of the subject, but it is strange that a paper of the standing of "The New York Sun" should print such a letter as this from an unknown writer:

"My observatory has recorded the presence of an eighth planet. It lies beyond Neptune. It is half sun and half planet. In one hundred years the effect of this giant straying on the other seven planets will have been so strong that our sidereal system, as we know it to-day, will have passed through tremendous cataclysms. But it will survive. The name of this new sun-planet is Nietzsche."

ing such astronomical nonsense:

"There is no foundation for this article. It is absolute foolishness. Who De Casseres is I do not know—I have never heard of him. Many such articles appear from time to time. Newspapers will naturally print almost any communication in the form of a letter, disclaiming, of course, all responsibility for what the letters may contain. Only yesterday I received a letter from another 'Astronomer' assuring me that he—or rather she, for it was a woman—had been holding interesting talks with the inhabitants of Mars, and offering (for a consideration) to tell me what they talked about. Such articles are perhaps amusing, but they should deceive nobody with the smallest knowledge of astronomy."

Silently one by one, in the infinite meadows of heaven.

Blossomed the lovely stars, the forget-me-nots of the angels.

—Longfellow.

Earth's crammed with heaven,
And every common bush afire with God.—Mrs. Browning.

The Mine of Interests and Pleasures in Unknown Names.

EDWARD F. BIGELOW.

How seldom does an unknown name suggest the possibility of a mine of treasures as valuable as gold, although such experience is not rare. Every person has had his pleasure in life extended by new acquaintances. We may hear a name and pass it by as meaningless, yet later that person's friendship may mean to us much more than words can convey.

by which to measure other entertainments. I have never yet found anything that I think is better than the formerly meaningless Wang. I have learned that a term absolutely meaningless may finally become an intellectual gold mine.

Dear reader, perhaps you shy and jump like a skittish horse when you see or hear a scientific name. You lean against the fence, your hands in your pockets, your eyes cast down. Now listen to these two words, Al-



HOW THE EDITOR OF THIS MAGAZINE BEGAN STUDYING ASTRONOMY TWENTY-FIVE YEARS AGO.

It is true that a word signifies nothing unless we know what it signifies. That sounds trite but it is equally true to say that strange words have become nuggets of gold to us.

I recall an experience of the kind in "Wang," the name of a comic opera. When it was first announced it made no impression upon me, and when I heard that tickets were selling rapidly I thought how silly it is for sensible people to find pleasure in that meaningless Wang. But when a friend induced me to call on Wang, I experienced a change of heart. The interview was the most enjoyable entertainment of the kind that I have ever had, and Wang has ever since been a standard

maack and Mesartim. Meaningless to you, are they? Never heard them before? The first is Gamma Andromedae, the second Gamma Arietis. You say, "They mean nothing. Go away." Please recall my experience with Wang. Come out and share in the continuous performance now going on at the Sound Beach Astronomical Observatory. Your new acquaintances, Almaack and Mesartim, will give you pleasure not heretofore realized by you, if you will do a little thinking along with seeing. You may make an original discovery in Mesartim and go back more than two hundred years to the time when Sir Isaac Newton was earning his fame, in those good old days

when so many people were making original discoveries. An astronomer, Hooke, was looking at a comet through his telescope. Near that comet he made a startling discovery. He found Gamma Arietis and the Mesartim. "I took notice that it consisted of two small stars very near together, a like instance to which I have not yet met with in all the heavens." That was the first double star ever discovered. Previously to that no one even imagined such a thing as a double star. You, my friend, may be in that condition of mind. Come to the observatory and change your mind. You may experience Mr. Hook's surprise and gratification. Gamma Arietis is a little twin jewel in appearance but in fact it is two mighty suns millions of miles apart and each probably as big as our one. Every astronomer that has ever seen Gamma Arietis calls it a "fine double," a white and a pale gray. It is indeed a "fine double," but Almaack is a "splendid double." Those that have access to a large telescope say that the little star is itself a double so that the system is really a triple. But if the little twinkler were divided into four, it would not bring to my mind so much pleasure as does its glimmering orange beside the emerald green of its brighter companion. There are other "splendid doubles" in the sky at the present time, but I think that, as I keep Wang as my standard of comparison for comic operas, so you will keep Gamma Andromedae, the Almaack, as the standard of excellence by which you will judge all "fine doubles."

In my personal opinion this is the finest double in all the heavens. It is my favorite. Well, wait a moment. It is difficult to tell which is the best. Of course you know I had a mental reservation regarding the astonishing blue and the dainty little companion of Rigel in Orion. Almaack and the blue Rigel. "I could be happy with either were t'other dear charmer away."

The Stars! Words fail me here. They filled my soul with a something deeper and a worship truer and higher than I had ever known in my three score years.—Mrs. David W. Jackson, Bartville, Pa.

Baseball Diamonds in the Sky.

BY W. B. CLARKE, M.D., INDIANAPOLIS,
INDIANA.

Professor Doolittle's article, "The Heavens in November," in your November issue interested me. While not an astronomer nor a student of astronomy, though perhaps I may be accused of sometimes being a stargazer, it is possible that I have made an astronomical discovery that may interest the lovers of baseball, from the President down.

As I gazed at the professor's circular representation of the constellations in their respective places, I thought I saw something, and then went out and scanned the sky for verifications, and found them, just as any other tyro can do these starlight nights if no strong and disconcerting electric lights are near. I enclose a diagram of what I saw, the interpretations being in red ink.

The aforesaid lovers of baseball, whether "our" team finished high or low, should be delighted to learn of my discovery that beautiful baseball diamonds, full of stars, make nightly appearance in the heavens at this late season of the year. It has not been determined what league these unchanging diamonds belong to, nor have scores of their games yet been received, but it is evident, reasoning from the popular Martian philosophy of these war times, that there is such a league. A little to the east of directly overhead (in the middle of Indiana) is a plainly outlined diamond, the prettiest of the whole lot; north of that another nearly as well defined, and four smaller and less perfect ones in the west, east and south, but whose teams are evidently traveling as their pitchers are not visible.

The plainest, most conspicuous and most perfect diamond is in the great Milky Way (perhaps appropriately, as in baseball it is the public that is getting milked) and belongs, as Astronomer Doolittle would locate it, a la constellation, to the Cygnus Club (right in the swim); the next most perfect belongs to the Pegasus Club (running well); two others to Ursa Major and Ursa Minor (continually growling at the umpire), with Cetus and Draco and perhaps Lyra trailing along behind. Any of the "fans" can easily find Cygnus and Pegasus any fine evening, and then can have my head for a football if they can't.

In Cygnus all the players are in almost perfect position, with the umpire, with a

base runner and catcher off third, while in the great square of Pegasus the catcher is off first and a base runner off third.

I will leave for the more imaginative and descriptive powers of the baseball editor the first report of a championship game between the Cygnus and Pegasus Clubs of the Heavenly League, as well as the detailing how the heavenly home runs are made. But may I suggest that, as a pastor in the East preached an eloquent sermon in favor of baseball on Sunday, the aforesaid absolutely indispensable editor collaborate with this pastor, or at least borrow from him some appropriate descriptive phrases illustrating this notable event?

Another point made plain in the Professor Doolittle diagram is the fact that there are a number of "dippers" in the sky besides the Great and Little ones. Even the great square of Pegasus, baseball diamond that it is, is a dipper with a handle, the latter being furnished by Andromeda, and Ursa Major and Ursa Minor are also both dippers, and so is Draco.

I will not further encroach upon your valuable space more than to ask your readers to get out your November number and study the diagram for the purpose of seeing how near they can come to the conclusions here arrived at. And if they want to see a picture of the writer it will be found on page 197 of the same number, as I nominated the big tree that took the prize as the largest in the United States. The other man is Mr. Dixon, owner of the tree.

What is Beyond our Universe?

There is a definite thinning out of the stars as we penetrate to vast distances into the star cloud; evidence which has convinced us, contrary to our former belief, that we are reaching or have reached in some directions, the true limit or boundary of our immense universe.

Almost infinitely extended though our wonderful universe is, when we have reached its boundaries it is impossible for our minds to stop there. Whether beyond is infinite but empty space, or whether one universe succeeds another, absolutely without end, one conception is as utterly beyond the powers of our little minds as the other. But if, having seen that our Milky Way universe is limited, we shall ever

discover that there is another, almost infinitely distant one, its existence, so far as we can now see, can only be revealed to us by its disturbing pull upon our own vast cloud of suns. And this slight but continuous disturbance of our system as a whole will, if ever, only be revealed to us by the exceedingly accurate measures belonging to the science of astronomy of position.—Eric Doolittle, C. E., Professor of Astronomy.

Distance and Number of Stars.

At present we know the distances of some three hundred stars, and it cannot be doubted that in the course of a few years this number will be increased to many thousands. So accurate is the new method that if a star is no farther than 163 light years away its distance can be thus directly measured.

But the great cloud of suns around us contains millions upon millions of objects. The latest estimate from Cambridge is that the number of visible suns in our universe is no less than 1,600,000,000. Though we can directly measure the distances away of but a few thousands of these can we reach no reasonable conclusions in regard to the true distances, sizes and distribution of the others? We can indeed acquire much reliable information on these points, but it must be obtained indirectly. And our greatest source of information comes from the so-called Proper Motions of the stars.—Eric Doolittle, C. E., Professor of Astronomy.

On almost any moonless night when the sky is perfectly clear, and the soft shades of twilight have vanished, a most enjoyable half-hour or hour may be spent in gazing upon the immense deep blue expanse above, bedecked with roving planets and scintillating stars. The beautiful constellations—strange groupings of the brighter stars, handed down from the antiquity of the ages—are always present in God's great outdoors, and are ever changing as the months go by, constituting a scene of marvellous and impressive splendour, and at the same time affording an unfailing field for study, of the highest interest and utility.—"The Call of the Stars" (Kippax).

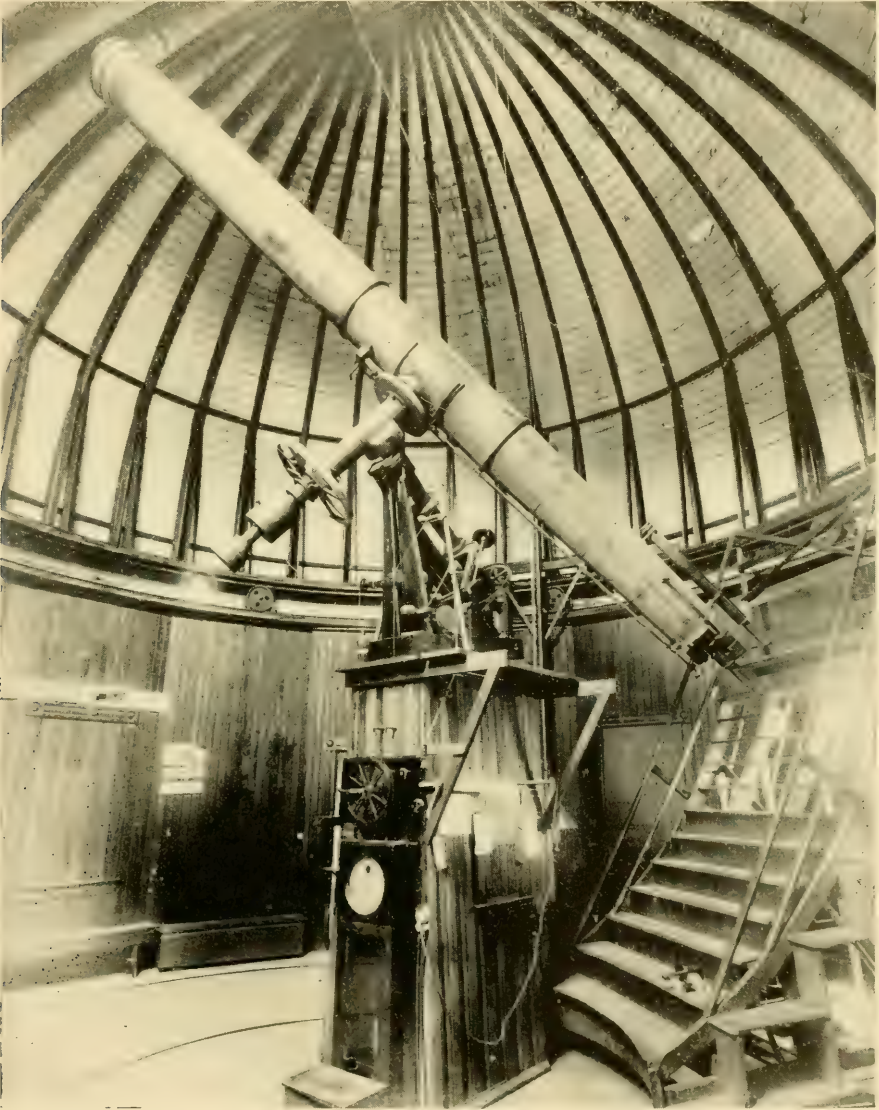
A Midnight Mountain Message from an Astronomical Observatory.

BY EDGAR LUCIAN LARKIN, DIRECTOR OF
THE LOWE OBSERVATORY, MOUNT
LOWE, CALIFORNIA.

[Especially written on the summit of the mountain for the readers of THE GUIDE TO NATURE.]

I have been looking at the Milky Way and upon the huge disk of Jupiter with

doubted. The fact is that during all my years in observatories in Illinois I never really saw the unutterable splendors of the Milky Way, the star strewn way, until I came to this peak. As I write, the stillness and the solitude are absolute. The imagination is alert, and there alone on the mountain summit I seem almost to hear the axis of the earth turning in space. I just glanced toward



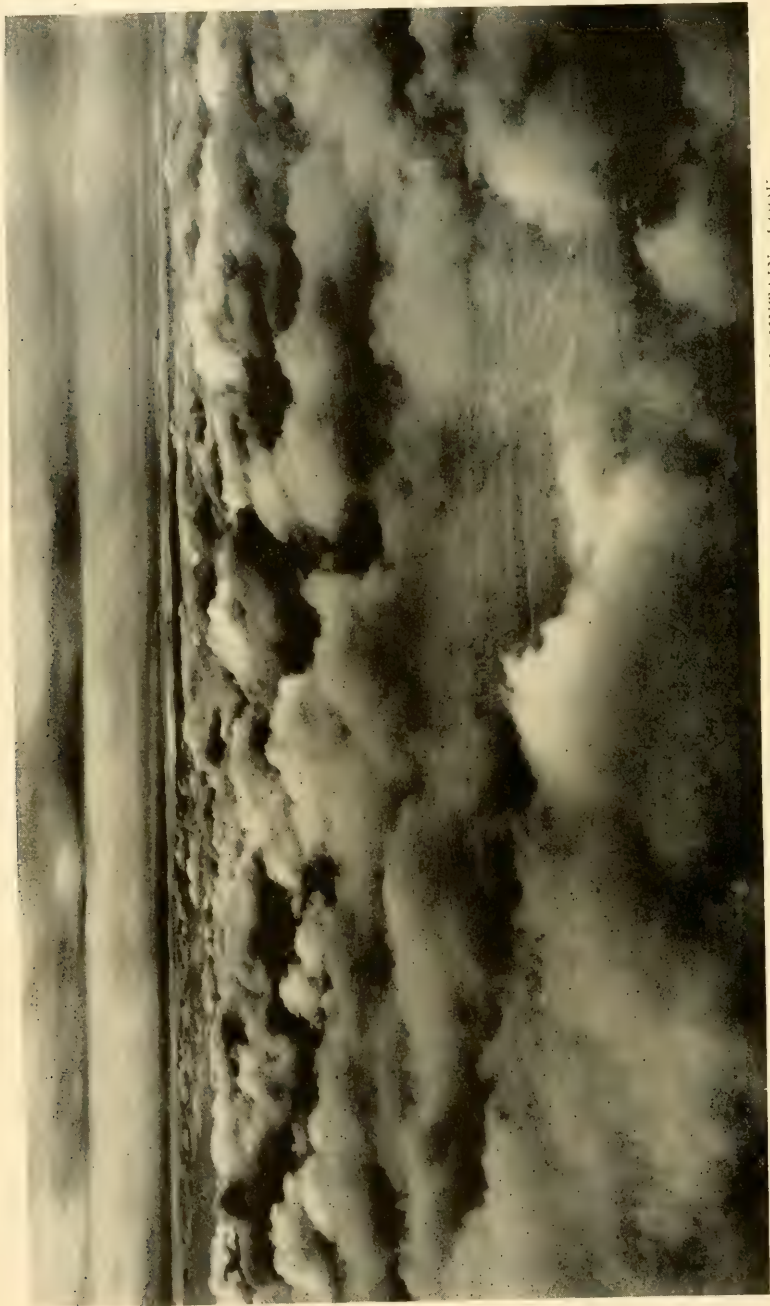
THE LOWE EQUATORIAL TELESCOPE.

This illustration and the one on the following page are lent to us by "The Theosophical Path," Point Loma, California. They originally appeared in Professor Larkin's book, "Within the Mind Maze."

the sixteen-inch Clark & Sons equatorial. The air is so pure to-night that were I to tell of the inconceivably minute points—all giant suns—that I have seen deep within the galaxy, my words might be

the south window of the observatory and beheld the majestic Goddess of the Night, personified as from the Galaxy. She is displaying her supernal robes adorned with millions of stars. Owing to the

rotation of the earth, she is dragging the hem of the garment in the Pacific Ocean, for the gorgeous stellar hosts by untold millions in Scorpio and Sagittarius are glittering points emerge from peaks and vanishing beyond the watery wastes. My crags worn by the wind, scarred and



A REMARKABLE PHOTOGRAPH TAKEN FROM THE SUMMIT OF ECHO MOUNTAIN, LOOKING SOUTHWARD.

A rapidly changing cloud effect has been secured. During a momentary opening in the clouds a glimpse of a small area in the north part of Pasadena, far below was caught.

southern and southwestern horizons are water, while the eastern is a series of majestic sentinel peaks rising thousands of feet above the floor of the canyon far

shattered by the lightning. To-night I beheld a moon of Jupiter rise behind a distant rock before the edge of the mighty disk appeared. Early this morn-

ing, September 6th, 1915, the edge of Saturn's ring was seen projecting beyond the stone before the globe came into view. The star-lighted vault celestial seems to be just around and about the mountain summit. One can almost touch the stars, the illusion is so apparently real and so fascinating. There is another remarkable summit and canyon effect. The telescope reverses, therefore by looking with one eye at the instrument and the other at a peak, literally millions of galactic suns seem to pour downward in a colossal flood toward the yawning abyss, blacker now than Egyptian night. At this approach of midnight, giant suns are blazing in all directions with an effulgence unseen in observatories on the plains below. Here one is not "near to Nature's heart," but within it. One must indeed be debased and "out of tune" if he is not deeply impressed by the supernal beauties of Mars and Saturn so near conjunction.

THE WORLD'S GREAT UNIVERSITY.

I have just returned from thirty days' research into the amazing astronomical and electrical wonders of the Panama-Pacific Exposition. The transcendent products of the Mount Wilson, Lick and other observatories advance those making these astonishing photographs to the dignity of exalted beings. Each step in the evolution of suns from nebulae is shown in photographic detail. Nature cannot lift a hand without being instantly photographed. No such collection of stellar spectra has ever before appeared. One can see the laws of nature in action. Astronomer Kapteyn's concept of the drifting of the stars is confirmed, for there are the paths of nineteen hundred suns that are moving toward Orion in majestic march. The motion of our own sun with reference to the Taurus stars, including the Pleiades, during the last eight hundred thousand years is on display. The instrumental exhibits of Warner & Swazy, of Brashear, and of the United States Government, present the perfection of human work in precise measurements. Brashear's diffraction gratings are there, glowing with superb colors, and telling man of the elements composing the sidereal universe; the telegraphone, recording human speech; and the audian amplifier, in circuit between New York and San Francisco, and capable of making audible the faintest whisper

in either city—these three wondrous triumphs of genius stamp their inventors as master minds. But on this summit, in the "witching hours," I am writing of things supernal, in a peace that passeth all understanding, due to the laws of nature. I look upon scenic and cosmic splendors, and know that all these wonderful things are in the mighty clutch of pure mathematics. The amazing effects due to chemically pure atmosphere, the mirage of perspective, the exquisite panorama of peaks—these and the balmy air of a California night in the mountains conspire to set the mind in the path of peace and happiness.

I have attended the inspiring sessions of the American Association for the Advancement of Science, the Astronomical Society of America, and with the members of these societies and of the American Mathematical Society have visited the Lick Observatory on Mount Hamilton. As I entered its classic dome, I put my hand on the spectroscope, the world famous instrument that has accomplished the seemingly impossible task of measuring in the line of sight the specific speeds of flying suns as they approach or recede. A few years ago this seemed to be beyond the power of man, but it is now accomplished fact. The year 1915 has astronomically been of fascinating interest.

—Lowe Observatory, 2 minutes A. M. September 7, 1915.

May Now View the Sunspots.

On Thanksgiving Day the Sound Beach Astronomical Observatory was used for the first time in viewing the sun. The telescope showed very effectively quite a fair-sized sunspot then in good position for observation. A view of the sun and its spots may also be projected through the telescope upon a white cardboard on the wall of the observatory, so that several people may see the sunspot at the same time. These first experiments in solar observation were made by the director of the observatory, assisted by S. C. Hunter, an amateur astronomer of New Rochelle. Mr. Hunter had already contributed \$50 towards the observatory, and, in addition, on this recent visit, he presented a very fine sun diagonal, costing \$30. The observatory is now well equipped and in readiness for viewing anything in the heavens.

Death of Carl A. R. Lundin.

Mr. Carl A. R. Lundin died in Cambridge, Massachusetts, on November 28th, 1915. He was born in Wenersborg, Sweden, January 13th, 1851. Subsequently his family removed to Falun where his education was obtained at the Falun High School. Early developing a taste for mechanics he decided to become an instrument maker and soon after his graduation went to Stockholm where he served an apprenticeship of seven years. From thence he went to Christiania, Norway, and was associated with Olsen, the famous instrument maker of that city. In 1873 he determined to come to America, and soon after his arrival in August of that year he entered the employ of Alvan Clark & Sons (who had become famous) as their chief instrument maker.

From the beginning he was interested in the optical part of the work and, finding him possessed of unusual promise, Mr. Alvan Clark induced him to devote his entire time and study to the art. Up to the time of Alvan Clark's death a strong attachment existed between the two men, each recognizing and appreciating the ability of the other. It is interesting to note that Mr. Lundin was the only man in whom Mr. Clark ever saw sufficient promise to induce him to educate him in the science of objective making.

Mr. Lundin had two children—a son, C. A. Robert Lundin, who for the past twenty years has been associated with his father in the making of telescope objectives at the Clark works, and a daughter, Laura M. Lundin, a graduate of the Massachusetts Institute of Technology and now a professor of mathematics and physics.

Mr. Lundin's first important work was in connection with the thirty inch objective for Pulkowa, Russia, and he was especially designated by the Russian government to take the objective to Russia and install it. At the time it was made, it was the largest glass in the world. In the making of the thirty-six inch objective for the Lick Observatory and the forty-inch objective for the Yerkes Observatory, he bore a prominent part. A particularly fine example of his work is Dr. Lowell's twenty-four inch objective located at Flagstaff, Arizona. He also made the sixteen inch for the University of Cin-

cinnati and the eighteen inch for Amherst College.

Nearly his last work was the six inch refractor for the Agassiz Association. This telescope was received October 20th, only a little over a month before his death.

He was a Fellow of the American Association for the Advancement of Science, and a Charter Member of the Astronomical Society of America. In recognition of his services to science, Amherst College in 1905 conferred upon him the degree of A. M.

Faithful Work of an Astronomer.

Dr. Furness, of Vassar, writes entertainingly of the disappointment felt by one, who, fired by a love of astronomy, visits an observatory for the first time, and watches an astronomer at his work. He is not found sitting at the end of a great telescope, looking at a Lunar landscape or a planet, and uttering from time to time an irrepressible exclamation of delight at what he sees, nor is he ever hunting in the sky for something new. Instead, he is probably passing hour after hour placing a fine spider's thread upon the exact centers of successive stars, or determining to the hundredths part of a second the instants when other stars are crossing his meridian—occupations which to the uninitiated seem utterly uninspiring and devoid of interest.—Eric Doolittle, C. E., Professor of Astronomy.

A Poor Telescope.

Sir Robert Ball used to tell a story of an experience he had when he was at the Dunsink Observatory. A farmer came to him one day and asked if he might look at the moon through the telescope.

"Surely you can," said Ball. "Come round tonight."

"Can I see it now?" asked the farmer.

"I am sorry that you cannot," said the astronomer. "You will have to wait until night."

"Huh! Then your old telescope is not so great a thing as I thought it was!" said the man. "I can see the moon at night without it."

The gray squirrel is reported to be increasing in England, where it is not at all desired.



Where are the Really Interesting Things?

A few days ago, a garage not far from our office caught fire. The whole town turned out to look, and I was assured that it was a spectacular sight, when the great volumes of black smoke rolled upward, and the flames leaped across the driveway and began to beat against our post office building. If I had been at home, I probably would have joined the crowd to gaze upon the fire and the smoke and the laboring firemen.

On the same day, in the Sound Beach Astronomical Observatory, only a few rods from this local conflagration, which was watched by hundreds of people, one could view a fire large enough to devour half of the United States, possibly the whole earth. Sound Beach, yes, the state of Connecticut, might be dropped into this fire and it would vanish like a chip in a bonfire. Not only for a few minutes, but for days was this seething maelstrom of whirling flame a spectacular sight.

A few called to see it and some of these appreciated what was taking place and were awed by its grandeur. Others looked at it and said, "Is that little black thing what you call a spot on the sun? It isn't much, is it? True; Things are "much" only relatively.

Not long ago, I wandered away with my camera and came to a picturesque ravine down which gurgles and laughs and plunges a wonderful brook. From its side I looked at this miracle of rushing water, but I had the sight to myself. Not a human being was visible in the moist earth at the ford, there was no print of a foot except the print of a cow's hoof.

As I returned to the office, I saw the road crowded with people, traffic suspended, vehicles blocked and a multi-

tude gazing. What was the attraction? A water main had burst. Spurting, gushing streams were leaping into the air, muddy water filled the gutters and ran into the ditches. At that moment the spirit of Lowell, the poet, said to me, "The most winsome and wayward of brooks draws now and then some lover's foot to its intimate reserve, while the spurt of a bursting water pipe gathers a gaping crowd forthwith."

Why is it that the first shall be last to attract the general mass of human beings? On earth at the furthest for only a few decades, amidst a wonderful universe, with every inch of earth's surface crowded with wonder and beauty, why do the gigantic events of nature go unconsidered, and the tiny marvels remain unseen? After the earth has swung around the sun for only a few more times, human eyes will no longer be able to see them.

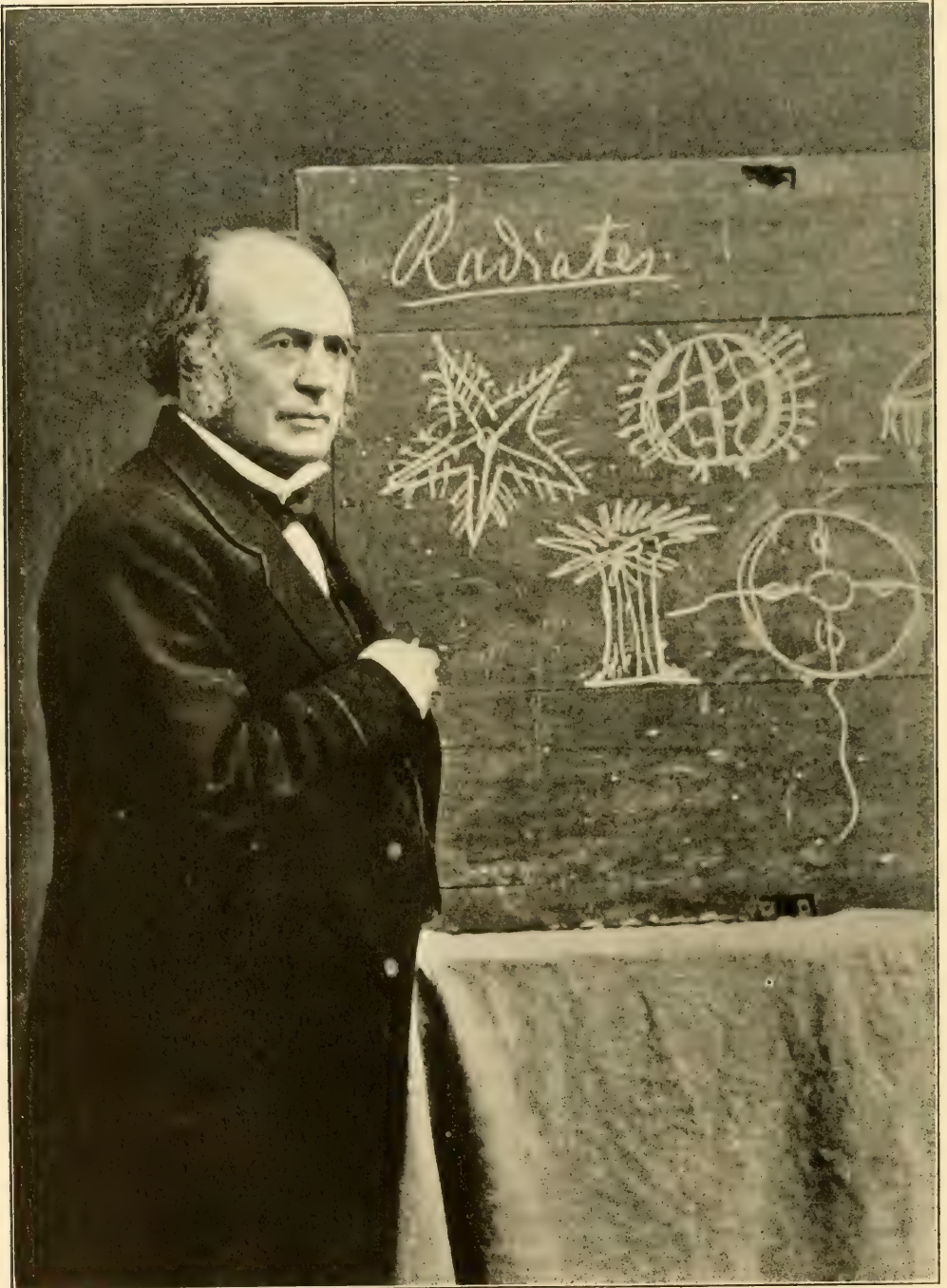
If I were to go to a distant place, or if I were to visit a great Exposition, and had only a limited time in which to stay, do you think that I would not use every minute to the best possible advantage? This world is only a larger and more extensive Exposition, with God as the exhibitor. Why not so live and see that there be not an eternity's loss and possible regret that more of the marvelous things of time were not seen with that intensest enthusiasm that they merit?

Through the printer's error after final proofs had left this office, The Agassiz Association was referred to in the December number as The Agassiz Society. It is probable that all our long time friends understood this to be an error, but we call attention to it for the sake of those that have recently come to us. We are not a society, but an Association of societies known as Chapters, together with individual Members.

Studying Nature in a Barn.

Forty-three years ago next summer, Louis Agassiz established in a barn on Penikese, an island off the southern shore of Massachusetts, the most famous school for the study of nature that

has ever existed. From that school went out innumerable influences in various channels. A pupil, David Starr Jordan, is at present a Trustee of The Agassiz Association. The school was held in a barn rather hurriedly fitted



LOUIS AGASSIZ, THE MASTER TEACHER WHO INSPIRES EVERY AA MEMBER.

"He seldom spoke without a piece of chalk in his hand * * * * Those who saw his genial smile that portrayed his kindly heart * * * * were influenced for life, and they in their turn have influenced thousands of others."



OUR FIVE FIRES CHAPTER (GREENWICH, CONNECTICUT) HOLDS ITS MEETINGS IN A BARN.

up for the purpose. Professor Holder in his "Louis Agassiz: His Life and Work" tells us of the first day and of Agassiz's opening the school with silent prayer, a fact recorded in the poem by Whittier and familiar to all our readers.

Dr. Jordan says:

"None of us will ever forget his first sight of Agassiz. We had come down from New Bedford in a little tug-boat in the early morning, and Agassiz met us at the landing-place on the island. He was standing almost alone on the little wharf, and his great face beamed with pleasure. For this summer school, the thought of his old age, might be the crowning work of his lifetime. Who could foresee what might come from the efforts of fifty men and women, teachers of science, each striving to do his work in the most rational way? His thoughts and hopes rose to expectations higher than any of us then understood.

"His tall, robust figure, his broad shoulders bending a little under the weight of years, his large round face lit up by kindly dark-brown eyes, his cheery smile, the enthusiastic tones of his voice, his rolling gait, like that of 'a man who had walked much over

ploughed ground,—all these entered into our first as well as our last impression of Agassiz. He greeted us with great warmth as we landed. He looked into our faces to justify himself in making choice of us among the many whom he might have chosen.

* * * * *

"The old barn on the island had been hastily converted into a dining-hall and lecture-room. A new floor had been put in; but the doors and walls remained unchanged, and the swallows' nests were undisturbed under the eaves. The sheep had been turned out, the horse-stalls were changed to a kitchen, and on the floor of the barn, instead of the hay-wagon, were placed three long tables. At the head of one of these sat Agassiz. At his left hand always stood a movable blackboard, for he seldom spoke without a piece of chalk in his hand. He would often give us a lecture while we sat at the table, frequently about some fish or other creature the remains of which still lay on our plates."

In that famous school Agassiz taught his pupils to take the near-by things of marine life and study them. He then stood at the blackboard making sketches of the things under consideration.



LEADERS OF THE FIVE FIRES CHAPTER CONTINUING AGASSIZ'S METHOD AT THEIR BLACKBOARD IN A BARN.

Those who saw his genial smile that portrayed his kindly heart and knew his ideals as a teacher were influenced for life, and they in their turn have influenced thousands of others.

The work still goes on under the auspices of The Agassiz Association. Young people are everywhere inspired by the influence of Agassiz to investigate the commonplace things nearest to them, to note the details and to in-

spire others by their studies.

It seems peculiarly fitting in the fifth decade after that famous school in the Penikese barn that we should have established in a barn in Greenwich a Chapter known as Five Fires. Youthful enthusiasts are there taking the commonplace things and sketching them so to note their detail. In our illustration Master Lewis, Vice-President of this Chapter, is shown in the



THE OAK PANEL ON OUR OFFICE DOOR.

Quoted from a motto of Agassiz's school in a barn.

act of continuing the method of black-board demonstration as it was established forty-two years ago by the great Agassiz himself. Master Lewis and his associates are studying the details of a flicker's nest much as Agassiz studied the radiates and demonstrated them to his pupils. This is the right spirit, and the commonplace objects of nature are the best objects.

Chapter No. 1052, Nashua, New Hampshire.

Our Chapter enjoyed a successful season during the fall, winter and spring of 1914-1915. We do not hold summer meetings, as our members are at that time widely scattered. We have about thirty members and hold our

never short of funds to carry on our work.

We have enjoyed some delightful evenings among the stars, especially those spent at the observatory of the Reverend T. C. H. Bouton, who is ever ready to place his six inch telescope at our disposal.

Studying bacteria under the microscope of Dr. Bradford Allen proved particularly valuable. The description of the "Distribution of Seeds" aroused great interest. Several evenings were spent in studying "Bird Architecture." Wild flowers, trees, ferns, birds and many other nature subjects were considered. We have now begun a systematic study of "The Geological Story," to occupy most of the winter months. If the interest shown in the first meet-



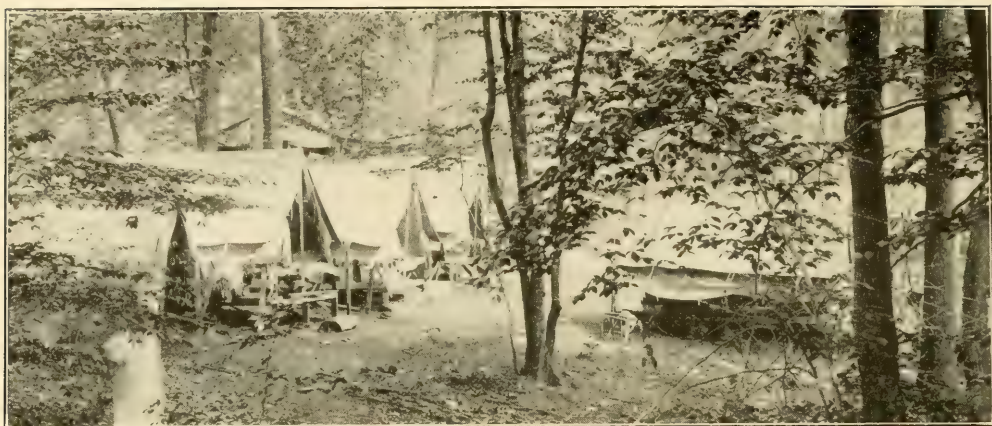
THE ENTRANCE TO THE CAMP OF THE CAMP FIRE GIRLS' AA CHAPTER.

The Camp Fire Girls along this part of the Connecticut coast have formed an union AA Chapter, meeting at ARCADIA once a month.

meetings fortnightly in the Unitarian Church or at the homes of the members. Organized as the "Nature Club" connected with the local Unitarian Church we sought and obtained, about a year ago, membership in The Agassiz Association. We have no dues, but those that so desire contribute five cents at every meeting. Nearly everybody "chooses" to do this, so we are

ing on the subject, "The Three Great Classes of Rocks," is any indication, the meetings this winter will be followed with absorbing interest. Numerous specimens add greatly to the value of the discussions. We take frequent field trips, especially in the spring during the bird migration.

MANLY B. TOWNSEND.
Class Leader.



WHERE AA GIRLS SPEND SEVERAL WEEKS NEAR TO NATURE.

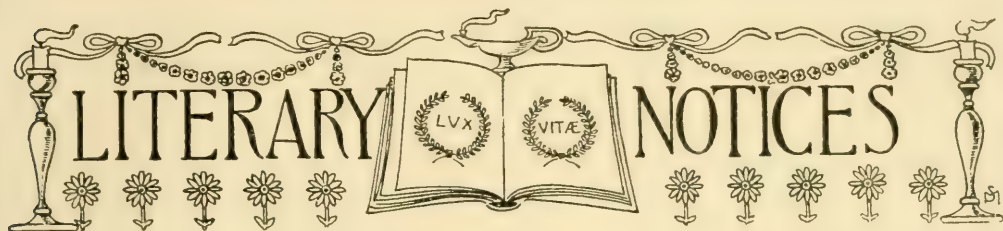
Old Wire Mills Camp Chapter.

On Saturday evening at five o'clock the Camp Fire Girls from Sound Beach, Riverside and Greenwich gathered at Welcome Reception Room, ARCADLA. The girls were chaperoned by their guardians, Mrs. Lewis W. Barney, of Sound Beach, Mrs. I. Newton Lewis and Mrs. Seaman Mead of Greenwich. After supper the girls were called to order and Mrs. I. Newton Lewis acted as chairman. The Old Wire Mill Camp Chapter of the

Agassiz Association was organized with Miss Genevieve Seeley, of Greenwich, as president; Miss Emma Knapp, vice-president; Miss Clara Schotanus, of Sound Beach, recording secretary; Miss Reeves, corresponding secretary and Miss Margaret Smith, of Riverside, treasurer. It was voted to meet at Welcome Reception Room last Friday in January at 5 p.m. Dr. Bigelow gave a short talk on the stars and then took the girls out to look through the telescope.



A PRACTICAL AND ENJOYABLE WAY OF STUDYING THE INTERESTS OF A BROOK.



WAR, SCIENCE AND CIVILIZATION. By William E. Ritter. Boston, Massachusetts: Sherman, French & Company.

The author treats the subject biologically exactly as he would treat some phase of nature. He does not stop with theories and their proof, but indicates what our nation can do with its present supreme opportunity toward leading the world to permanent peace.

THE ESSENCE OF ASTRONOMY. By Edward W. Price. New York City. G. P. Putnam's Sons.

Here is a volume of popular astronomy quite different from the usual variety.

It answers in untechnical language the everyday questions of everyday people, the material being so arranged as to be readily available for reference, as well as for consecutive reading.

THE MOON. By Garrett P. Serviss. New York City. D. Appleton and Company.

What Mr. Serviss writes on astronomy is always interesting. In this book he has made the subject especially attractive since he has adopted a conversational method, in imitation of the style of an eighteenth century French classic. The entire book is readable and instructive. We cordially recommend it to our readers. The photographs are the best to be obtained from the Yerkes Observatory.

THE CALL OF THE STARS. By John R. Kippax, M. D., LL. B. New York City. G. P. Putnam's Sons.

This readable book gives a concise and accurate story of the starry heavens, together with the legends that time and fancy have associated with them. It is intended, not for professional readers, but for those that desire to know about the wonderful things in the sky with their interesting myths. The illustrations and charts are effective and interesting. We cordially commend the book to those of our readers that are beginning star study.

OUR DOORYARD FRIENDS. By Sara V. Prueser. Steinway Hall, Chicago, Illinois: "The Platform," The Lyceum and Chautauqua Magazine.

This is mostly devoted to birds in fulfillment of the author's desire to interest both young and old in the life and beauty of the out-of-doors. She makes no claim to novelty nor to much originality, but she has a thoroughly good individualistic point of view. The book is pleasingly illustrated and the publishers have done their work well. Among the many interesting photographs, perhaps the most attractive is that of a house wren that built her nest in a clothespin bag and there reared her young.

MY GROWING GARDEN. By J. Horace McFarland. New York City: The Macmillan Company.

When searching for a semi-suburban plot, the author of this book stumbled upon an old house of hybrid design, together with a couple of acres of abandoned vineyard. What he and his family do during a half-dozen years to make out of this a notable garden home, on a scale at once modest yet inspiring, is the theme of the volume. Mr. McFarland is well known for his enthusiasm for forestry and outdoor life, and also as head of the American Civic Association, leading in the fight for the preservation of Niagara Falls.

PLANT LIFE. By Charles A. Hall, F.R.M.S. Soho Square, London, England: A. & C. Black, Ltd. American Agents: The Macmillan Company, 64 & 66 Fifth Avenue, New York City.

This attractive book treats the subject in a scientific way, but is sufficiently elementary and explicit to interest the general reader. The beautiful illustrations make it an ideal gift book. In addition to the colored plates, of which there are several, there are numerous clear and beautiful photographic illustrations.

The book attempts no detailed description of any special phase of plant life, but rather embodies a broad view of the whole field.

THE SUN. By Charles G. Abbot, S. M. New York City: D. Appleton and Company.

Everybody is interested in the sun. All life depends upon the sun, but it must be confessed that many persons' interest seems to be not all that it should be as a matter of actual knowledge. The design of this book is to have the rays of knowledge reach head and heart and to sweep away the clouds of ignorance that so often obscure those rays. The author has succeeded remarkably well in placing on his pages much that is new to the amateur and of especial interest to the professional astronomer. The book has also been nicely adapted for school and college use as well as for the general reader. The chapter, "The Sun among the Stars," clearly sums up various facts and theories pertaining to the sun. The human race knows but little, comparatively speaking, regarding the sun and other heavenly bodies, but the author expects much in the future, as he states:

"There still remains, and ever will remain in solar and stellar investigation, room for such work; and on the thorough doing of it in our time the wonderful flowers of future discovery, whose beauty our eyes cannot see, or our imaginations picture, must largely depend."

BEEKEEPING. By Everett Franklin Phillips, Ph.D. New York City: The Macmillan Company.

The needs of the beekeeper with a few colonies are considered in this book as well as those of the specialist who devotes his entire time to honey production. The treatment of the subject is based wholly on fundamental principles. The author presents the essential manipulations in their logical order and shows the desirability of eliminating all that is non-essential. Since tools alone do not make a good beekeeper the consideration of apparatuses is subordinated, though all of the equipment is briefly described and illustrated.

THE CHILDREN'S BOOK OF BIRDS. By Olive Thorne Miller. Boston, Massachusetts: Houghton Mifflin Company.

This interesting and attractive book will fulfill its purpose to interest young people in the ways and habits of birds, and to incite them to further study. The author for many years has had extensive experience in talking on the subject to boys and girls in the schools. She reports that the result of some of these talks has been astonishing. The book is well adapted to the continuing of this good work in a wider range. The illustrations too are many and effective. The publishers have seconded the author's efforts in every respect, as might be anticipated from their high standing and well-known efficient work as publishers.

THE AMERICAN ANNUAL OF PHOTOGRAPHY 1916. Edited by Percy Y. Howe. New York City: The American Annual of Photography, Inc. Distributing Agents: George Murphy, Inc., 57 East Ninth Street, New York City.

As usual, this book contains a vast amount of illustrative and textual material. To the reviewer, the best article in the volume is "The Anastigmat Lens and the Average Amateur" by A. H. Beardsley. It is well written and to the point. It covers the question, Why is an anastigmat lens better than a rectilinear, and why is a rectilinear not so good as an anastigmat? The question has caused much discussion and from this new point of view both sides are right. The photographer will get the most out of a lens in which he firmly believes and to which he is best adapted. Mr. Beardsley makes it clear that that principle applies not only to a choice between an anastigmat and a rectilinear, but to a choice between the various kinds of anastigmats. I have never before seen so clear an explanation of the fact that a rectilinear is better than an anastigmat and that the anastigmat is also supreme. The anastigmat is better only when the photographer can use it to better advantage. The following quotation from the article is worth careful consideration:

"A motto handsomely framed and illuminated by electric lights should be hung in every store to read, 'Never buy an anastigmat lens without solemnly taking the oath to master its proper use.' Just because you paid fifty dollars for a lens in no way guarantees you better pictures. Note this and give

it thought. The more you pay for your lens and the greater its reputation the more time and attention you *must devote* to it in order to obtain results. This statement is born of actual fact."

TEN YEARS' WORK OF A MOUNTAIN OBSERVATORY. By George Ellery Hale. Washington, D. C.: The Carnegie Institution of Washington.

This little book, published by The Carnegie Institution of Washington, and beautiful in a mechanical way, contains much of value. The illustrations, particularly those of the sun and the nebulae, are remarkable. Every American, especially every one that is interested in astronomy, must have a feeling of pride at what is being accomplished by Director Hale and his efficient assistants at Mount Wilson. We cannot thank him enough for placing before us these remarkable results of astronomical investigations.

The Mount Wilson Solar Observatory, like other great observatories in the United States, is doing the work of a big manufactory or warehouse; it is producing and storing an enormous amount of material that would be interesting and useful to the public. Here is shown the need of many small observatories like the new one at Sound Beach to disseminate this information among those that crave a knowledge of the wonders of the heavens.

WILD BIRD GUESTS: HOW TO ENTERTAIN THEM. By Ernest Harold Baynes. New York City: E. P. Dutton & Company.

Every friend of American wild birds—everyone who wishes to be their friend, will find this book a source of joy and inspiration. As a result of his own wide experience, the author is able to show why the birds are in sore need of our friendship; why it is so well worth our while to give it to them, and then, how we may give it to them in such a way that it shall be profitable alike to the birds, to us, to our children, and to the country at large.

There is a delightfully intimate description of Meriden, N. H., "The Bird Village," and of the interesting results already attained by the residents there through following the author's methods of attracting wild birds; and in later chapters these methods are described in detail, step by step, so simply that even a little child may follow them. Finally, for the benefit of those who may feel inspired to work with him to still further advance the cause of bird protection, Mr. Baynes tells exactly how to organize and manage an active bird club. With the assistance of his readers he hopes to spread a network of such clubs over the United States—the happiest possible solution of the problem of American wild bird conservation.

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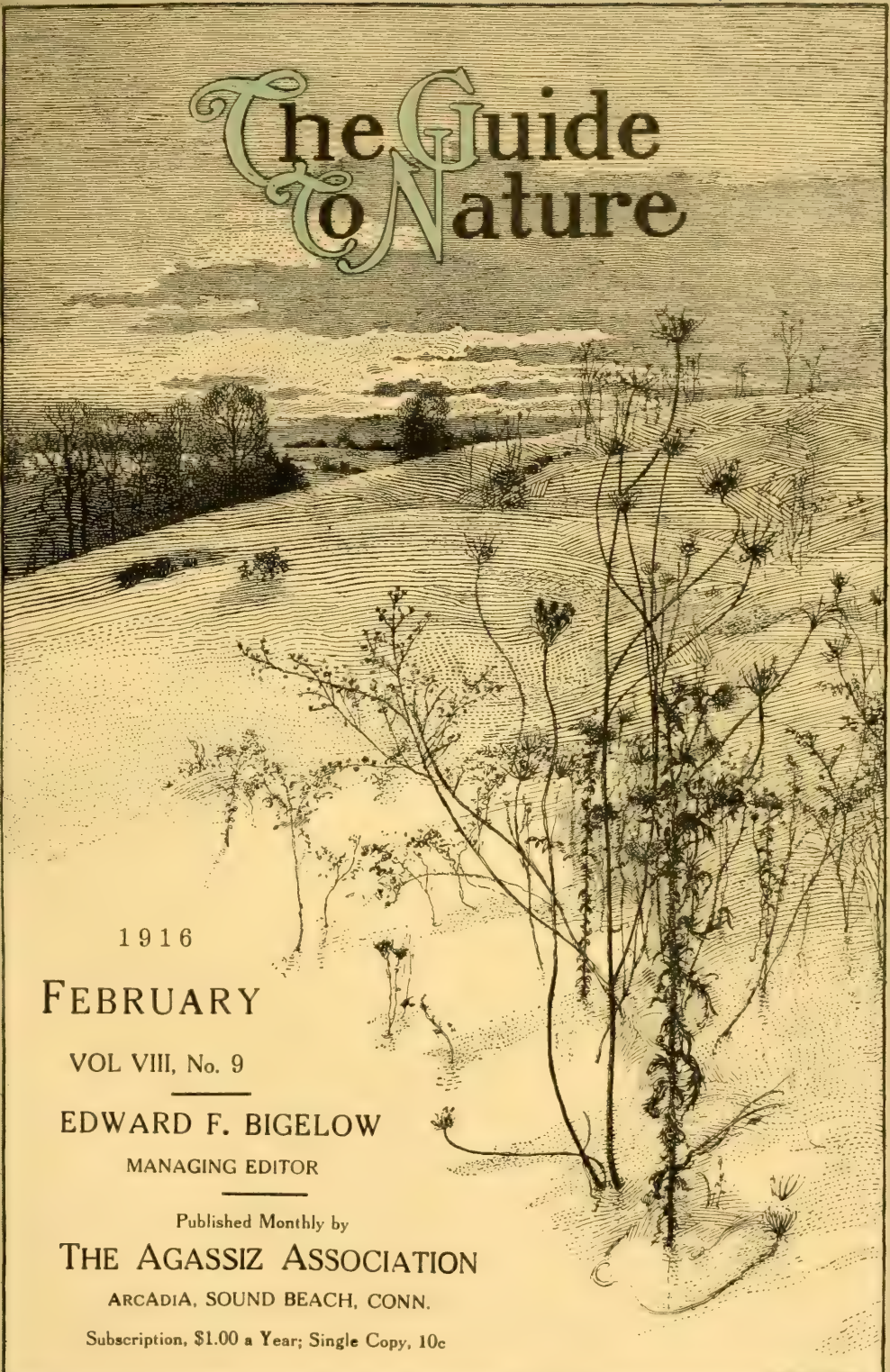
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It is generally agreed that Edward F. Bigelow, of ARCADIA, Sound Beach, Connecticut, is one of the most interesting instructors of any who have addressed the institute in recent years. His talks are not only entertaining but are based along lines that will prepare teachers for the new vocational work and his subjects cover a wide range. Mr. Bigelow's lectures have attracted considerable attention locally and there have been many in attendance who are not connected with the teaching staff of the county. These visitors are cordially welcomed by the pedagogues.—"The Danville Gazette," Danville, Indiana.

The torpedoing of an oil steamer off the east coast of Scotland has caused the death of thousands of shore birds. The escaped oil coats the surface of the water, and so beplasters the feathers of the eider ducks, puffins, razorbills and guillemots, that the wretched birds can neither fly nor dive. Therefore they starve and their dead bodies strew the beaches.

The Guide To Nature



1916

FEBRUARY

VOL VIII, No. 9

EDWARD F. BIGELOW

MANAGING EDITOR

Published Monthly by

THE AGASSIZ ASSOCIATION

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Of course she had reference to "Blessed are the merciful," but Philip had another answer:

"What God hath joined together, let no man put asunder."

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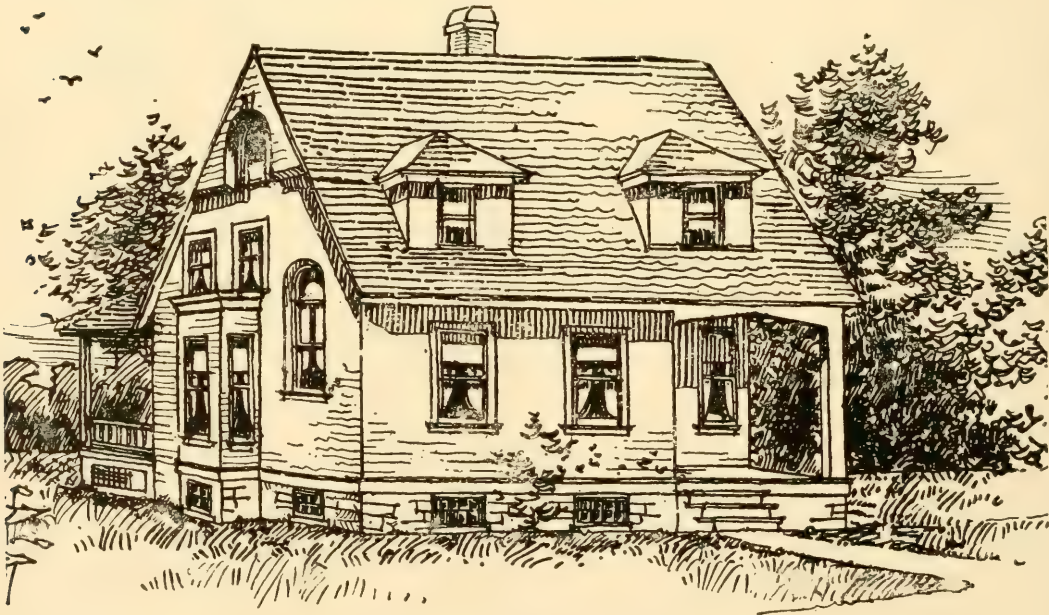
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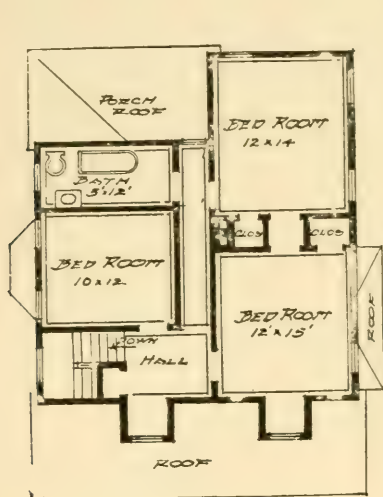
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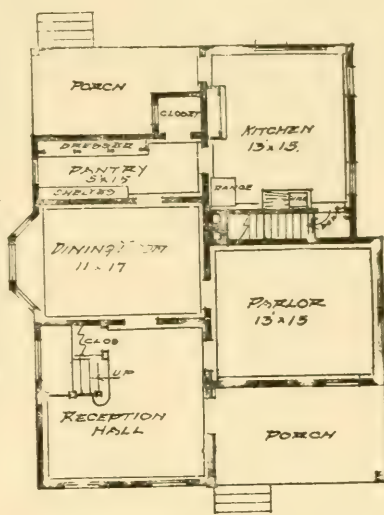


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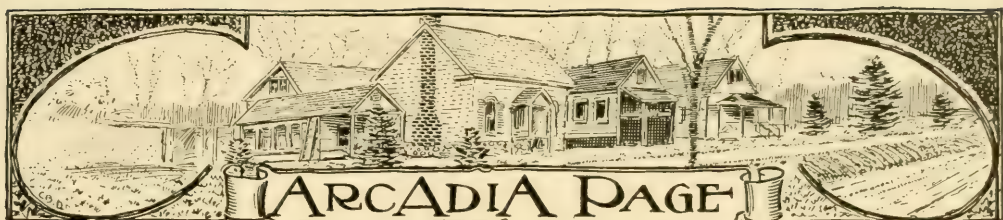
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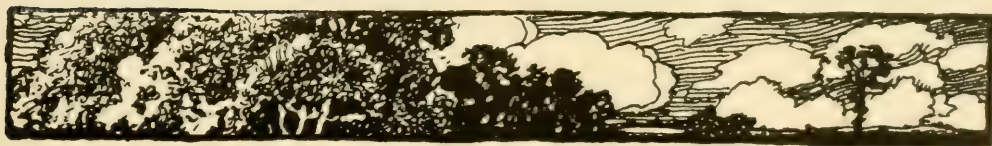
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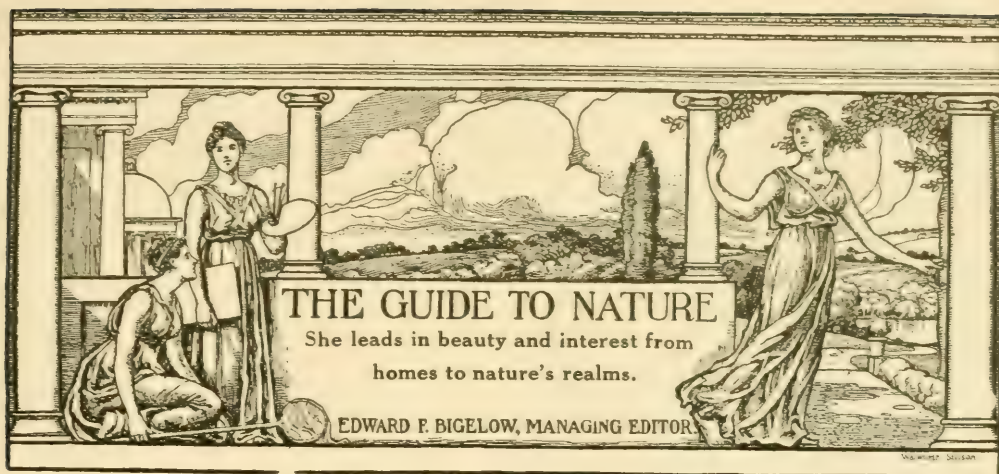
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Number 9

Honeybees that Live in a Rock.

The full page illustration shows a remarkable home of honeybees in a rock located in Griffith's Park about six miles from Los Angeles and two miles from Lindale, California. The editor of "Gleanings in Bee Culture" has kindly lent us this illustration, and from that interesting apiarian magazine we glean the following:

The park contains three thousand acres of mountain scenery, beautiful drives and zoological gardens, but beekeepers will be interested in what is perhaps the biggest bee rock in the world, and in the several bee trees that stand in the reservation. The rock is on high ground, and while it commands an extensive view of the surrounding country, it is itself so perforated by holes and excavated by cavities that it has become a fantastic object, in which we may see the forms of animals and the faces of men. In these cavities are located colonies of bees, some of which are probably enormous in size. Apparently no one has ever explored the interior of the rock or made any attempt to take the honey. The rock is difficult of access; but bees can be seen flying in at the various apertures.

The Defenceless Menhaden.

BY JOSEPH W. LIPPINCOTT, BETHAYRES, PA.

Fifty or more Wilson terns were hovering over a small cove in that intent fashion which invariably denotes that they have found a large school of small fish. Every now and then there was a splash as one of the birds darted into the water, and often there were other splashes and swift gleams of silver as large fish, over zealous in their pursuit of the small prey, broke the surface.

I drifted down wind in a small boat until in the midst of the swarm of screaming terns where, several feet below me, I could see a vast army of small fish—young menhaden—thousands and thousands of them not travelling in any direction as is their wont, but evidently feeding upon the infinitesimal animal organisms in the sea water.

As I watched, a few, perhaps a hundred, shot upward disclosing a large fish—a flounder—in hot pursuit. They scattered along the surface the terns, ignoring me, dashing down to catch them. Two were carried off by the terns, one by the flounder. It all happened in a moment, then once more the hoard was feeding all unconcernedly. And this had been going on for days, perhaps, in one way or another, ever since the little fish emerged from the eggs.

In the cove, a reef divided them from the bay, a reef covered by snaky rock weeds several feet long which moved with the motion of the water and evidently frightened the menhaden back whenever their leaders attempted to pass over it. They had come in during the wet weather and now they chose to remain although each day saw more terns collecting to feed upon them from above and more large fish and crabs to attack them from below.

The tern army was openly encamped on the near-by rock evidently intending to stay there until the last menhaden was caught. It could only operate by day so as if to further aid in the work of extermination, night herons collected in the evening. I counted seven standing motionless at the water's edge each ready to strike with swift bill.

One thing might save them—a storm—a rough spell of high turbid water that would carry them out of the cove in spite of themselves. A month went by and it did not come, a month during which the fish vanished, probably at the rate of about a thousand a day. And even if they rushed the barriers, what then? What chance for them, defenceless in a world of enemies. Perhaps they were wise; I did not meddle, but went away wondering at the way of life and—hoping.

Mossy Glen.

BY A. W. BROOKS, OMAHA, NEBRASKA

This picture shows a deep ravine between the hills near Strawberry Point,

Iowa. Just beyond this spot is the head of the glen, where the waters come tumbling over the rocks from the springs above. Ferns of many kinds grow in profusion, and it would not be easy to find a square inch of ground, rock, tree trunk, stump or log that is not covered with mosses. Hence the name, Mossy Glen, a delightfully cool spot on a hot summer day, and restful to the eyes.

Lightning from a Clear Sky.

"A bolt of lightning from a clear sky" is a phrase familiarly used to illustrate some event considered to be of extremely unlikely occurrence. Yet that very thing is reported from the Connecticut village of Ellington this week. There were a few clouds low on the northern horizon, but the sky was the color it usually is when bending over the blue water of the Bay of Naples. Such was the apparent aspect of things when a discharge of lightning swept down the main street of the village, paying unwelcome visits to six different dwellings on the way, and in each displaying its proverbial freakiness. But there was no freak or wonder in the whole performance greater than the fact that nobody was killed.—The Stamford (Conn.) Advocate.

Open wide every window and door,
Let in all the sunshine, I pray;
And when falls the curtain of night,
Let it wrap you about till the day.
—Emma Peirce.



"A DELIGHTFULLY COOL SPOT ON A HOT SUMMER DAY."

Unlimited Food Supply from the Ocean.

The ocean, points out Professor J. Stanley Gardner in a report on British fisheries, is really much more fertile than the land. The earth produces one crop a year, or at the best two or three, but the minute vegetable organisms which nourish the life of the sea grow a new crop every day.

If, therefore, the wild life of the water were kept down as the wild life of the land is, so that only the useful creatures are allowed to multiply, there is no practical limit to the quantity of human food that reaches out of the soil or is yielded.

We commonly think of all the plant food that leaches out of the soil or is allowed to flow away as sewage as so much total loss to mankind. It now appears, however, that much of this in the economy of nature is recovered again. The nitrogen, phosphorous and silicon abstracted from the land help to nourish the plant life of the sea. This in turn is consumed by the fishes, only to be returned once more to the land when the "sea food" reaches the market.

Recent studies of the British fisheries show that in the abundant vegetable food of the North Sea most food fishes grow three times as rapidly as in the Baltic, and no less than eight times faster than in the cold waters of the Arctic Ocean, while four year old herring from the White Sea are only one eighth the size of those of the same age from the fishing grounds about Iceland in the same latitude. As for the sea creatures simpler than the fishes, their growth is almost entirely a question of the food supply. Two starfish, for example, hatched from the same lot of eggs, may differ in size by five thousand times.

The Brook.

BY A. W. BROOKS, OMAHA, NEBRASKA.

This looks like a fisherman's paradise, but it is not. The spring floods make it impossible to keep the stream stocked. It is, however, a favorite spot for picnics. Just above is a log cabin with a big fireplace, and across the stream is an ice cave, where ice may be had for making ice cream. This cave, the remains of a tunnel dug into the hillside by lead prospectors, has, with



"A FAVORITE SPOT FOR PICNICS."

the exception of a few feet at the mouth, caved in, and in the hole thus left is a pool that is always frozen solid—why no one knows. Perhaps the hills are a vast storehouse of ice buried there since the glacial period. The photograph was taken in eastern Iowa, near Strawberry Point.

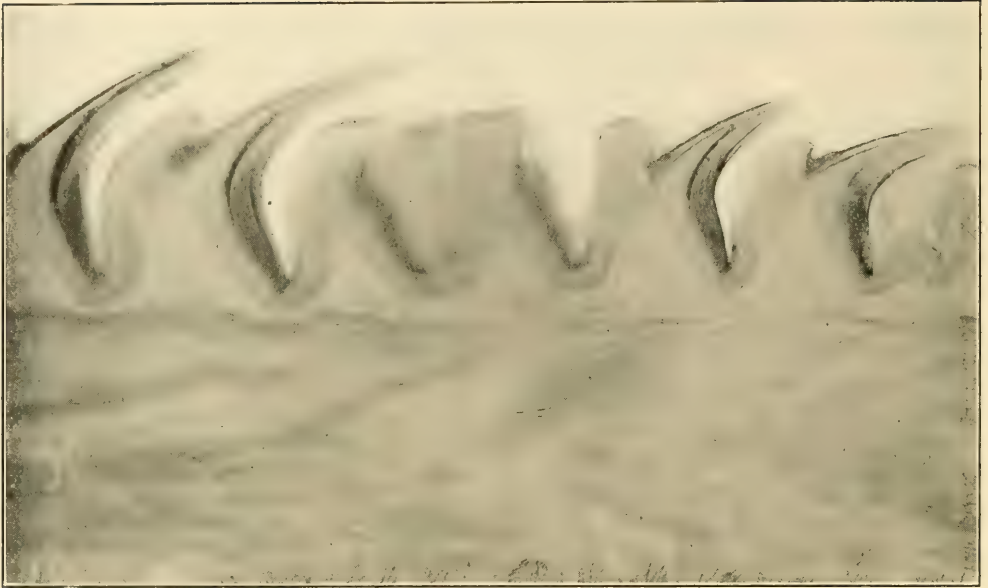
The Workers and Money.

It is quite probable that the workers of the United States might be described accurately about as follows:

Ninety per cent trying to make money, thinking of little else.

Seven per cent despairing of making money, and bitterly envying those that have money.

Three per cent thinking of earnest, useful effort apart from money, like the noble Agassiz who said he hadn't time to make money. (That three per cent allowance is very generous.)—N. Y. Journal.



A PHOTOMICROGRAPH OF A SMALL PORTION OF THE UPPER SURFACE OF A CAT'S TONGUE.
By Edward F. Bigelow from a section prepared and mounted by H. C. Wheeler, Montreal, Canada.

The Roughness of the Cat's Tongue.

BY H. C. WHEELER, MONTREAL, CANADA.

A few days ago I received a letter from the editor in which he says, "I often wonder why microscopy has been so sparingly popularized in comparison with other sciences." I often wonder at this myself, when I think of the many pleasant hours that the microscope has afforded me. It cannot be from the lack of things of interest to look at, because there are thousands of such things around every dwelling, no matter how humble or confined it be. Nor yet can it be from the cost of a microscope, as there are many excellent ones to be had for a few dollars and that would afford any one real pleasure in the examination of the common things that surround us.

Take, for instance, the common house cat. Her tongue is rough, but I doubt if one person in a hundred has given the matter any thought as to the cause of this roughness. The illustration shows a piece of pussy's tongue. The reason for the roughness is at once apparent. Note the little pockets that the hooks' form. These enable her to get the meat from the bones that she has for dinner, the hooks acting much the same as a rasp. She can get the bones cleaner than can we with our knives and forks. All members of the feline tribe have this rough tongue. In lions and tigers it is so pronounced that to have one of them lick your hand

or face would very likely be painful and draw blood.

This is only one instance out of the many thousands that are accessible to all. The tiny flowers on the grass are things quite as pretty as some of the flowers in the florist's window. All they require is to be magnified so that our senses can become acquainted with their beauty. Get a microscope and look about you and you will see that the world is not such a bad place after all.

The Box Elder a Maple?

"Is the Box Elder a Maple?" is the subject of long discussion by Amos B. Plowman in the *Botanical Gazette* for September. After examining every minutest point of leaf, wood, root, blossoms, and bark of the two trees, and also the fossil forms of both, the author reaches this conclusion.

The box elder was an early offshoot of the maple group, which took on its present day characters as a result of the storm and stress of the Glacial Period. In other words, it is a modified maple, especially designed to withstand the rigors of the Great Ice Age. But the buffetings of this trying time have so far altered the pre-glacial character of the box elder that in its modern form, it is no longer to be counted among the maples. Nevertheless, amongst other marked differences certain striking similarities still survive.

Fitting for Immortality.

The thought of immortality ought to be one of the utmost seriousness. One must somewhere learn to live in immortal things. Tell me honestly—the sort of existence that many people are here dragging out is it worth perpetuating? Is it worth while to lengthen frivolous and useless lives to infinite age? What good do they do here? What good would they do there?—Rev. Dr. Marion D. Shutter, New Haven, Connecticut, in a sermon on “Meaning to Immortal Life.”

The latest theory of the origin of the starfishes and sea urchins is that they are both merely greatly modified forms of the crab-lobster group.

Interesting Specimens.

Through the kindness of Mrs. Edwin Binney of Sound Beach we have been favored with an interesting specimen of the well-known Hercules beetle of South America. In the textbooks the ordinary form, that of the male, is shown on account of the huge horns. The difference between the male Hercules beetle and the female is the reverse of what occurs with the ordinary mosquito. It is the female mosquito that bites and stings; the male is rare. Few know the female Hercules.

The same contributor has also favored us with a remarkably good specimen of a trap-door spider and the nest. The door is well shown in the photograph from

Mrs. Binney's specimen reproduced herewith. In “The Spider Book” Professor Comstock tells us as follows of the structure and action of this door:

“The door is provided on one side with a hinge which is merely a continuation of the wall of the tube into the layer of silk that forms the foundation of the door.

“The inner surface of the door presents the same appearance as the silken lining of the tube, being a firm layer of silk; but



THE FEMALE HERCULES BEETLE.

the outer surface of the door is covered with earth and made to simulate in a very perfect manner the surface of the surrounding soil, so that, when the door is closed, very careful observation is necessary to detect the presence of the nest. In those cases in which the nest is built in soil covered with moss, moss is planted by the spider upon the door of the nest.”

These were all forwarded to Mrs. Binney by Mrs. M. E. Stead from Carthage, North Carolina.



TRAP-DOOR SPIDERS WITH A NEST.

DOMESTICATED NATURE



Why Keep Rabbits or Cavies?

BY CHARLES H. ELLARD, NEW YORK CITY.

Keeping a few rabbits or cavies, the so-called guinea pigs, may not seem to have any scientific interest or importance, but in them is a tremendous amount of material for study and experimentation that can give one a liberal education in heredity, Mendelism and evolution.

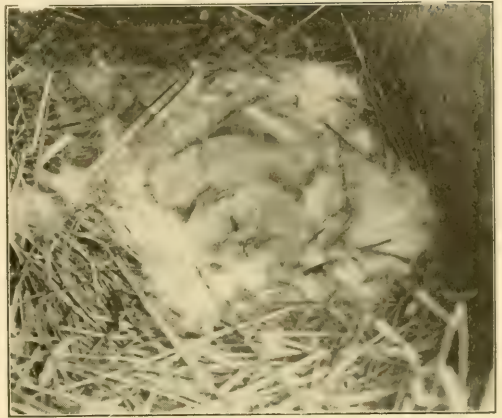
No one just "keeps" these pets and gets any profit out of it. The enjoyment and education are in proportion to the efforts he puts forth to develop his stock and their progeny until he approaches some ideal of beauty of form or color or fixes a type that is distinct. If these types have become fixed "permanently," people interested in fancy stock of this kind and controlling by their combined associations the "fancy," give their sanction to the new type, formulate standards, which are supposed to express the highest ideal of the type, and makes classes for them at the accepted exhibitions. The standards are intended to express the ideal of per-

fection in beauty of lines, form and color. Nature unaided would not produce such perfection. It is the breeder's endeavor to obtain results as near this ideal as he can. To do this he must study the probabilities to be expected from the parents of his future perfect specimen. He must know much of their parentage and must consider carefully the faults of each parent so that those in the one may be counterbalanced by the other. A case in point might be the tan rabbit. In breeding this we desire a deep rich black or blue marked with tan in certain definite places and ways about the body. One parent may be particularly good in these markings while the other may have a clear black in the body color. The probabilities of still better offspring would be good. But if both parents showed a decided tendency to have tan fur mixed with the black good results could not be hoped for from pairing such individuals. In all cases the breeding of any of the several varieties of rabbits, cavies, mice or what not when



A BLUE DUTCH RABBIT AND HER HAPPY CHILDREN.

it is done in the fancier spirit toward the development of the ideal of variety and type to which it belongs, becomes a matter of scientific study of no mean proportions. Results must be studied, mistakes corrected, several generations sometimes being needed to correct a single, simple blemish. But thought and care will bring you nearer and nearer to the perfect specimen. There is little probability that chance will produce results except in isolated and



THE VERY YOUNG RABBITS IN THE NEST OF FUR.



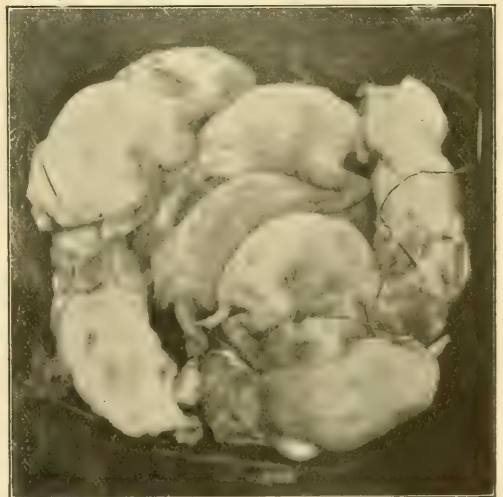
FUR PULLED BY THE MOTHER RABBIT FROM HER BREAST FOR ONE NEST.

Piled on a plate to show size of pile.

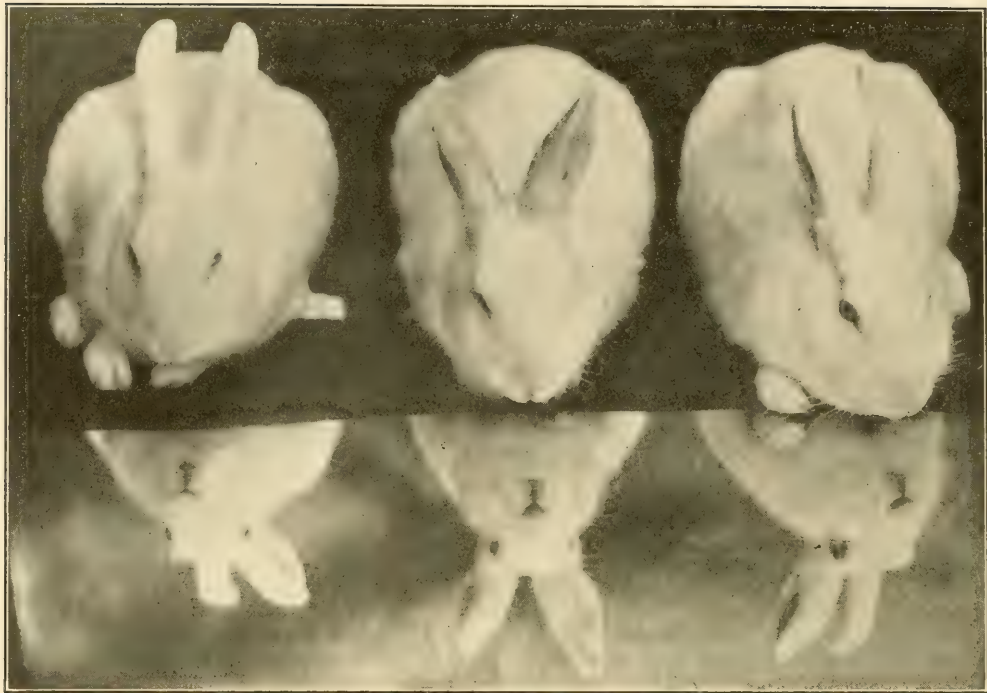
extremely rare cases, and in such the return to the faults of the parent and grandparent is usually pronounced.

When an active fancier of cavy, a railroad man, with whom I had discussed some of the ideals for which we were trying, and to whom I remarked that a white cavy with blue instead of pink eyes seemed to me a desirable type to produce, discovered on a trip to Washington what seemed to be this type, he purchased the pig, a female, and sent it to me. I determined to try to produce a strain that would breed true, like reproducing like. The pig sent me had about five colored hairs

near the scruff of the neck. I selected a pure albino mate. The young of the first mating showed of three one albino and two with some decided red patches. The albino was a male and I kept him and bred him with his dam and one of the red spotted ones to the sire. The next litters both showed a boar in one and two sows, in the other male nearly all white but having females a little more colored than the original dam. These were again crossed on the preceding parents that were either albino or showed the least color. By this careful crossing and recrossing at the end of twenty months I had two pairs of white pigs with blue eyes that bred one or two reproductions of themselves in every litter. There would also be a reversion to the patched or to the albino; had I been able to continue these experiments for another year there is no



RABBITS A FEW DAYS OLD.



WHITE BELGIAN HARES ON A MIRROR.



A CONTENTED FAMILY TAKING A RIDE.

doubt that such a variety would have been produced and maintained. In fact I believe Professor Castle of Harvard has obtained such results.

Results are more easily obtainable in animals whose period of gestation is short, such as mice, in which the blue-eyed white is not rare.

Similar study and perseverance must be applied to each and every variety. Whoever really endeavors to produce a specimen that will win a competitive place of the exhibitions of stock must bring his results before a competent judge who will make the necessary comparisons and criticisms. In most cases the judges are glad to make suggestions to help the breeder to obtain results nearer the ideal. This ideal is invariably one in which beauty of contour and of color is paramount. This gives us, in addition to the biological training, a sort of development in our aesthetic tastes. To approach the ideal of the standards in any fancy animal—horse, dog, cattle, rabbit or mouse—is no child's play. The young person capable of securing results is bound to have learned that thinking things out has much to do with success and will have gained a store of biological knowledge. He will realize, too, how men may use God's laws to enhance the latent beauty of these little creatures.

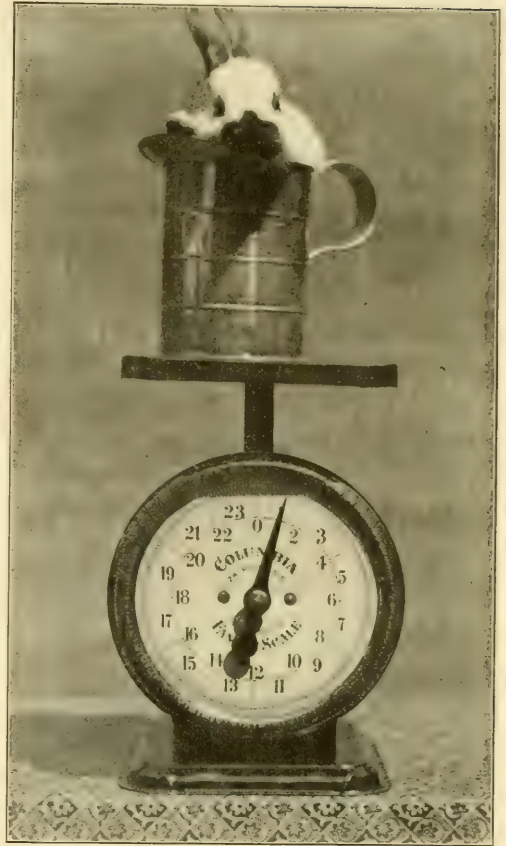
Who Can Beat This?

They have been discussing, in one of the English natural history journals, the strange idiosyncracies of cats in the things they like to eat. Here are some of the reports. Are American cats equally original?



A YOUNG CAVY.

Photographed by an apple for comparison of size.



"A PINT'S A POUND
THE WORLD AROUND."

One animal habitually refused both meat and milk, and preferred above all else raw potatoes. Once she got up on the table, and, ignoring a lamb cutlet, made off with a cucumber.

A Persian tom demanded regularly two raw potatoes, and for a change enjoyed asparagus, cucumbers, cabbage, tomatoes, vegetable marrow, melons, cocoanut and olives.

A Manx cat would risk a beating to steal baked pears.

Still a fourth cat devours earthworms and frogs, and in the spring will stand on the shore of a shallow pond and with its paw fish out masses of frog's eggs for a meal.

Even what most attracts us in the farmer's life is not its profitableness. We love to go after the cow not for the sake of her milk or her beef, or the money they yield, but perchance to hear the tinkling of the cow-bell—We would keep hens not for eggs, but to hear the cocks crow and the hens cackle.—Thoreau.



A HEN BROODING FIVE KITTENS.

Cut by courtesy of "Our Dumb Animals," Boston, Massachusetts.

Hen Mother's Five Kittens.

Mrs. Mary I. Glover, 318 North Avenue A, Canton, Illinois, has a buff Plymouth Rock hen that is acting the part of mother to five kittens, about six weeks old, says the *Daily Register* of that city. That this statement is no mere "newspaper story" is attested by the accompanying photograph, sent to *Our Dumb Animals* by a Canton correspondent.

The hen had been sitting perhaps ten days, when she left her nest to feed, and while strolling about the barn she discovered the kittens, whose nest was in a tub, and proceeded to adopt the litter and preempted their home. She will fight for the kittens and seems very much attached to them.

Mrs. Glover has attempted to persuade the hen to go back to her nest of eggs, in fact she has taken her back several times, but the hen apparently prefers the company of the kittens and immediately returns to them.

Equally strange is the story of the mother cat which has adopted a crippled chicken, a few miles out of Fayette City, Pennsylvania. The *Journal* of that town tells how Mr. Charles Grant took a number of chicks from an incubator, among them one so puny and

sickly that it was not expected to survive. But Mother Cat took it gently in her jaws, placed it in the nest with her kittens, and now tenderly cares for it and makes over it as if it were one of her own kind. The chick is flourishing and follows the feline mother wherever she goes.—*Our Dumb Animals*.

Old Museums Vigorous and Growing.

The oldest natural history museum within the limits of the United States was founded at Charleston, South Carolina, in 1773. That at Salem, Massachusetts, followed next, in 1799, as a repository for the curious treasures which the old shipmasters brought back from the ends of the earth to what was then one of the chief seaports of the country. The museum of the Philadelphia Academy of Sciences dates back to 1812; that of the Boston Society of Natural History to 1830. Of three great collections of the United States, the Natural Museum at Washington started in 1846; the Agassiz Museum at Cambridge, in 1852; and the Metropolitan Museum in New York City in 1869. All these old institutions are still as vigorous, as flourishing, and as up-to-date as if they were the youngest in the land.

The Curious Swimming Frogs.

All frogs can swim but most frogs do not stay in the water all the time. The African swimming frogs are thoroughly aquatic in their habits, and live in permanent pools which they have never been observed to leave voluntarily.

In the Reptile House of the New York Zoological Park three species of these frogs are on exhibition. The "Zoological Society Bulletin" says of the largest, known as the smooth clawed frog:

"It attains a length of body of four inches and has a smooth skin, except for several rows of thread-like filaments on the head and body. Its color is dull olive, with large variously-shaped spots on the back and limbs. The throat and abdomen are white, sometimes faintly spotted with brown. The head is comparatively small, flat, with small eyes, situated on top and looking upward. A star-shaped pattern of fine white filaments surrounds the eye. The mouth, which has teeth in the upper jaw only, is very wide. The three inner toes carry sharp, horny claws at their tips. The home of this frog is tropical Africa southward to Cape Town."



SERENITY AND CURIOSITY.

Cut by courtesy of The C. P. Goerz American Optical Company, New York City.

The Fir.

(Watched from a train.)

In phalanxes of green it crowns

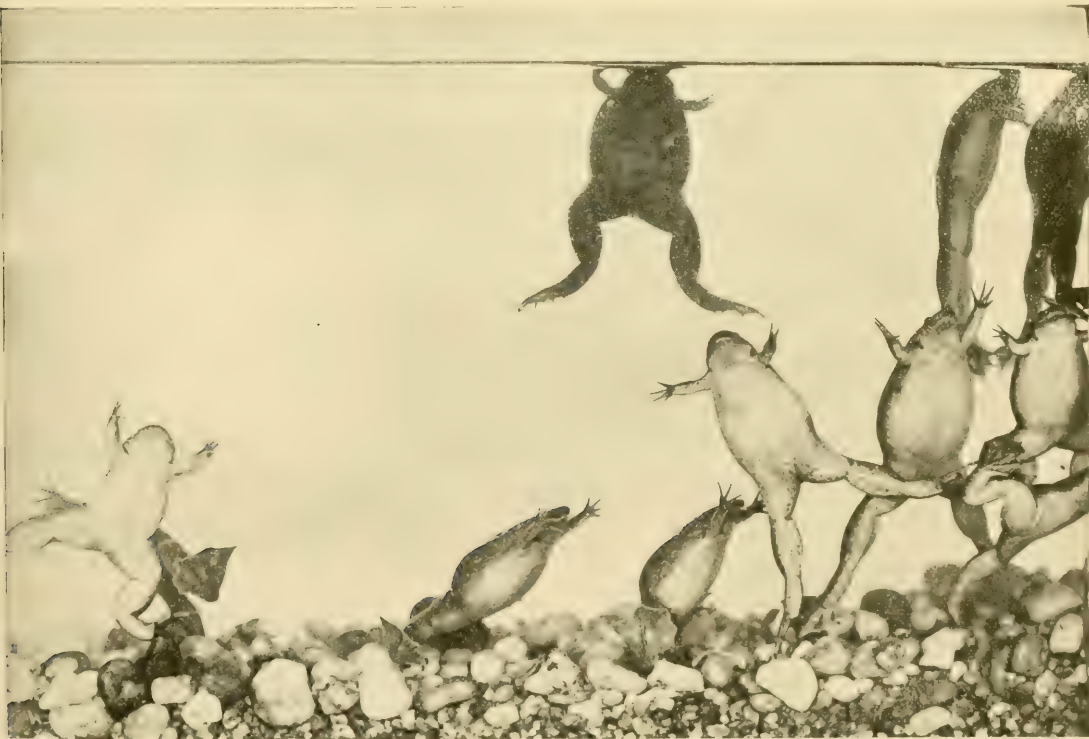
The hills, afar and near;

E'er breathing incense on the air,
So crisp and crystal clear.

Its spires pointing heavenward.

To where the cloudlands lie,
And melting off itself anon
Into the sunset sky.

—Emma Peirce.



AFRICAN SWIMMING FROGS.

Cut by courtesy of the "Zoological Society Bulletin," New York City.

TO KNOW THE STARRY HEAVENS

The Heavens in February.

BY PROFESSOR ERIC DOOLITTLE OF THE
UNIVERSITY OF PENNSYLVANIA.

Surely no one who turns toward the heavens on any clear evening of the present month can fail to be impressed by the wonderful beauty of the cele-

the west to the east, and that the magnificent Orion, Sirius, Gemini and Capella are in their highest positions in the heavens.

Always during this midwinter month the whole heavens are filled with these brilliant winter stars, but it is seldom indeed that no less than four of the



Figure 1. The Constellations at 9 P. M., February 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted).

tial objects that now fill the winter skies. At no time of any year will he ever witness this spectacle in greater brilliance.

* * * * *

The February Stars.

It is only during the evenings of February that the train of bright winter constellations forms a complete band across the southern heavens from

brightest planets are also seen shining in the evening heavens as we see them now.

High in the east, the red planet Mars shines out with six times the brightness of a first magnitude star. Almost on the meridian in the south is the whiter Saturn which, though less brilliant than Mars, is still nearly twice as bright as a star of the first magni-

tude. And in the west there is seen a pair of most beautiful objects made up of the brilliant, silvery Venus and the golden Jupiter.

From a very little watching, the observer will find that Venus is moving rapidly eastward among the stars. While at the beginning of the month it is far to the west of Jupiter, it will rapidly overtake and pass the giant planet and soon be found far east of it. The observer will find it very interesting to watch these two bright planets as they first draw nearer together and afterward separate from one another. Their closest approach will occur on February 13 at 10 P. M., when they will be seen separated by a distance considerably less than the diameter of the moon, the silvery Venus being then north of Jupiter. For several days before and after this date the two objects will form a conspicuous and beautiful star figure in the evening sky.

* * * * *

The Total Eclipse of the Sun.

In the forenoon of February 3, the moon will pass between the earth and the sun and at all points within a long narrow strip on the surface of the earth

west corner of South America, pass diagonally across the entire North Atlantic Ocean, and will finally leave the earth at the point B at 12 hrs. 31 min. 0 s. P. M.

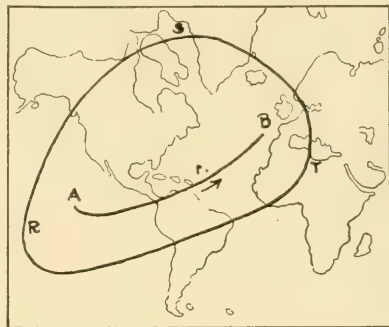


Figure 2. Region within which the solar eclipse of February 3 is visible, and the path of the moon's shadow on the earth.

The eclipse is an interesting and important one, for from certain points within the path the sun will be hidden for no less than 2 min. 36 s.

To all observers within the path, A. M. B. the sun will be completely covered by the moon. If we move over the earth farther and farther north of this path, we will, as it were, look more and more over the upper edge of our

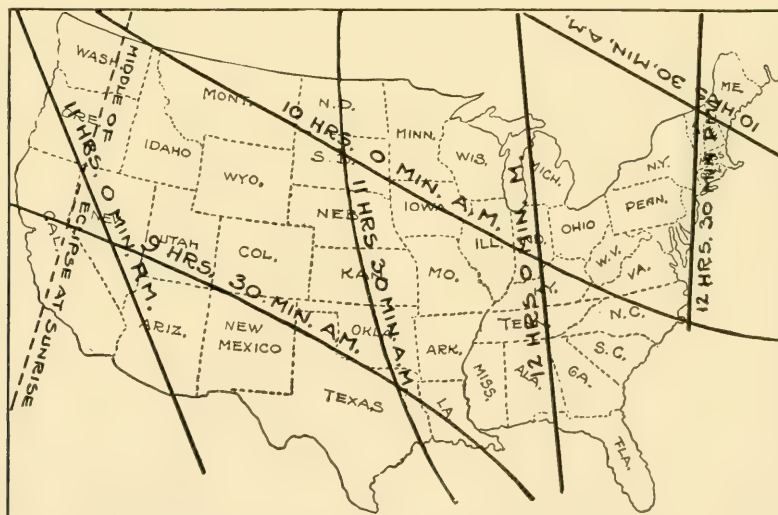


Figure 3. Showing the times (Eastern Standard) of the beginning and ending of the eclipse of February 3 for all points within the United States.

will completely blot out the sun's light. The shadow will first strike the earth at the point A (Figure 2) at 9 hrs. 29 min. 12 s. A. M. (Eastern Standard Time). It will sweep over the turning earth, crossing the extreme north-

moon and thus see our satellite displaced downward upon the sun's disc. To all observers in the United States the moon will thus be seen to pass across only the lower path of the sun and the eclipse will hence from this

country appear as a partial eclipse only. Finally, if the observer is north of the line R S T the moon will be lowered so far in the heavens that it will pass completely below the sun. To such observers the eclipse will be wholly invisible.

Observers within the United States can estimate the times at which the eclipse begins and ends at their stations by the help of Figure 3. The

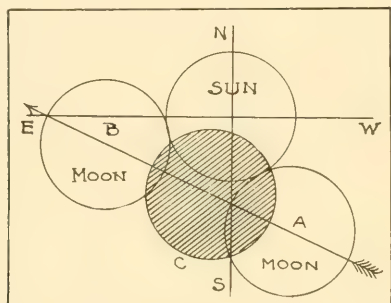


Figure 4. Path of the moon across the sun as viewed from Philadelphia on the morning of February 3rd.

lines running from right to left indicate the times of beginning and the vertical lines the time of ending. By measuring the proportional distances from his location to the two adjacent lines in each case he can find the times within two or three minutes.

For example, at Philadelphia we find:—

Edge of moon first touches edge of sun and eclipse begins (first contact) 10 hrs. 15 min. A. M.

Edge of moon passes off edge of sun (last contact) 12 hrs. 27 min. P. M.

The appearance of the eclipse as seen from Philadelphia is shown in Figure 4. The eclipse will begin when the moon's center is at A and end when this is at B, the greatest obscuration will occur when our satellite has reached the position C. Observers in the northern part of our country will see less of the sun covered than is here shown, while to those in the southern states the obscuration will be greater. From no point within the United States will the eclipse be total, but from all points it will be visible as a more or less striking partial eclipse.

* * * * *

The Planets in February.

Mercury will come into conjunction with the sun and enter the morning sky on February 5. It reaches western elongation on March 1 and for the last

few days of February may be seen shining brightly in the southeast for more than an hour before sunrise.

Venus, Jupiter and Saturn all shine brightly in the evening sky in excellent position for observation.

Mars is running rapidly westward and during the month will pass from Leo into Cancer. Its nearest approach to the earth of the entire year will occur on February 9, at 6 A. M. at which time it will be but sixty million miles away from us.

* * * * *

Why February is the Shortest Month.

In all the earliest calendars the month was the number of days in one lunation,—that is, from full moon to full moon or from new to new. As it is impossible to fit an exact number of such months into a year it was necessary to arbitrarily add or drop a lunar month from the calendar from time to time.

The resulting inextricable confusion was first remedied in B. C. 45 by Julius Caesar, who wholly discarded the moon from the calendar, adopting $365\frac{1}{4}$ days as the length of the year, the extra quarter of a day being readily allowed for by making each fourth year 366 days. February at this time contained thirty days and our seventh month also thirty days; Caesar named the latter July, after himself, and that it might be as long as any other month he transferred to it a day from February, leaving the latter with but twenty-nine.

His successor, Augustus Caesar, in like manner took possession of the following month, naming it August, and that it also might be as long as any month, he borrowed still another day from February to add to his own month leaving the former month with but twenty-eight days.

In the present year, however, February will contain twenty-nine days as 1916 is a leap year.



Contributions to the Sound Beach Observatory.

Mrs. Mortimer B. Foster, Sound Beach	\$ 5.00
Mr. George A. Galliver, Arlington, N. J.	5.00
Mr. Joseph M. Philbrick, New York City	5.00
Reverend N. P. Coleman, Riverside, Conn.	5.00
Mrs. C. O. Miller, Stamford...	10.00
Mr. Frederick A. Hubbard, Greenwich	5.00
Mr. C. Dana Potter, Sound Beach	5.00
<hr/>	
Total	\$ 40.00
Previously acknowledged...	\$1,001.43
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Grand Total.....	\$1,041.43

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Congratulations to Leon Barritt.

We heartily congratulate Mr. Leon Barritt of 150 Nassau Street, New York City, upon the decennial anniversary of his delightful little publication, "The Monthly Evening Sky Map." Mr. Barritt not only publishes this pleasing periodical, but he also supplies a number of newspapers with a syndicate service. He says:

"The combined circulation each month, of these papers has been for many years over one million and a half copies. By this continuous presentation of the subject of astronomy, popularly presented, to this great audience of general readers, the publisher believes can be attributed in no small degree the revival of interest in astronomy, which is daily becoming more apparent. . . . I have learned by my experience in this business something of its possibilities and its limitations. Dollars and cents, however, are not the measure of reward to those who work in the astronomical field. It is largely a labor of love to all who engage in it."

We extend the right hand of fellowship to Mr. Barritt, with hearty congratulations upon his achievements. his work has largely been a labor of a generous love; his excellent service has brought him only moderate financial returns, but his monthly has been a valuable and influential factor in developing an interest in astronomy.

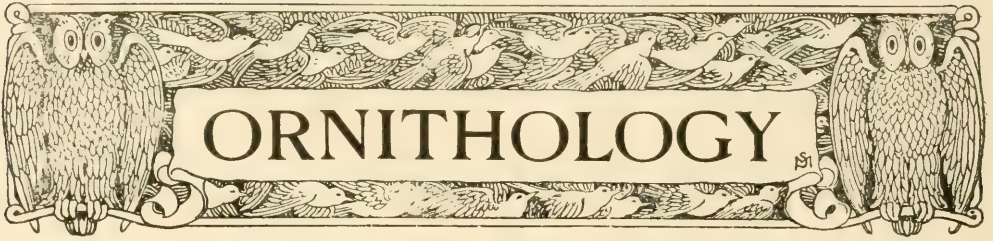
What is the Matter with Astronomy?

I am deeply interested in astronomy. I have found it a pleasurable diversion from the activities of a busy life, and I think everyone should become acquainted with the "friendly stars." The facts are, however, that the subject receives comparatively little attention. I have found that astronomy is not taught in a single Grammar School in the United States. A few High Schools give it consideration in connection with physical geography, and in the Colleges and Universities it is elective, and very few take it up. In my boyhood astronomy was a part of the curriculum in every educational institution in the country. What has brought about this great change? I believe it is largely due to the abstract manner in which the subject has been presented in text-books, making the subject repellent to teachers as well as students, and in no small degree has it been brought about by parents who want their children educated along lines that would have more commercial value. Statistics show that fully 75 per cent. of the children who graduate from the Grammar School do not enter High School, so this large percentage of boys and girls go out into life without the slightest knowledge of the great Solar System of which we are a part. They know nothing of the apparent rising and setting of the sun; the cause of the moon's phases, or any of the simplest facts regarding astronomy—"The Monthly Evening Sky Map."

* * * * *

When We Shall Know.

The child is said to long to grasp the moon. Who, in his maturer years, has never wished that he might stand upon the moon, and watch the earth at full, a glorious planet of the night, four times as far from rim to rim, and twice as bright in every part as is the moon herself! Who, thinking more gravely, has not wished sometimes he had been born in later years, when he could share the fuller understanding yet to come? Shall we not live in hope that if we worthily contribute to that happy end, we, too, may join with that great company whose patient and sound labors have given us what we know, and in a future life with them may see unrolled the wider view which here we long to see in vain?"—"The Sun" by Charles G. Abbot.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

Scaup Ducks in Their Winter Home.

As both the lesser and greater scaup ducks, known commonly as blue-bills, gather along the shores and ponds of our eastern states in the late fall they become particularly noticeable.

As the ponds and streams freeze over, or their food becomes scarce from some other reason, these birds gradually work their way southward, arriving along the Florida coast and in the larger lakes and streams about the first of December, though sometimes earlier. Here they spend the winter in the quiet waters of the semi-tropics, gathering in thousands and tens of thousands about the harbors of some of the towns, where they receive the protection of state and federal laws, and



A STREET IN THE BEAUTIFUL TOWN OF DAYTONA.

These two species, usually found together, have but slight differences in their markings and are practically indistinguishable except at very close range. Ordinarily they seem to associate little with other ducks, although they appear very sociable among themselves.

where they find ample food to their liking. Here they become so tame that in many instances they may be easily approached. This applies only, however, to their protected areas and the same birds outside become wild and shy, probably from being fired at by the gunners.



A FLOCK OF LESSER SCAUP DUCKS.

At Daytona, a beautiful winter resort situated on the Halifax River along the Florida east coast, we observed thousands of these birds—mostly the lesser scaups—in the latter part of November, and spent a number of hours in studying and photographing them. They were active and quick-moving on the water and are extremely rapid fliers, and we found them difficult to photograph on the wing. We noticed a whistling sound produced by the wings as the birds passed over our heads. Usually in their feeding, and while paddling about or resting on the water they were altogether silent, although occasionally a low whistling, or “purring,” would seem to run through the flock. These flocks, whether large or small, appeared to be under the leadership of some one bird. Shortly before sunset they would begin gathering for the night; circling ‘round and ‘round over an area about half a mile square on the water, gradually closing in to form compact bunches, and appearing like floating islands in the river.

Below Mosquito Lagoon the beautiful Indian River winds southward for about a hundred miles, being in some places two to three miles wide; its banks bordered with palms and other



SCAUP DUCKS IN FLIGHT.

Extending for twenty miles south of Daytona, is the government bird preserve known as “Mosquito Inlet Reser-

tropical vegetation. Here one passes through pretty villages, citrus groves and pineapple plantations. At Cocoa, on the west bank of the river, we found the ducks congregated in large numbers. Here for several years past during the winter months certain persons have become interested in these birds, and a flock of from fifty to several hundred may be seen daily near the bridge by the bank building, where they are regularly fed by these people. Both here and at Daytona we were able to call small flocks of these ducks across the water in answer to our whistling, when they would come—shyly at first, then more boldly—to feed upon the bread crumbs and other scraps which we threw out to them. I noticed in these instances that the ducks were much less shy than the drakes.

In some places we passed through flocks in our launch which, by careful estimates, I judged contained as many as ten thousand birds. Often these masses would simply divide, making a wide passage for our boat, when they would scuttle along low over the water with a great whirring sound.

Through the sixty-one mile canal from Ft. Lauderdale to Lake Okeechobee in the Everglades we saw but one lone duck. On the big lake, while there were immense flocks of coot, but few of the ducks were noted, although we saw many thousands of them on the waters (or more properly speaking, the liquid mud) of Lake Hicpochee and Lake Flirt. This was in the latter part of December. Their numbers grew gradually less as we passed through the waterways to the west coast, and we noted a conspicuous absence of scaup ducks along the borders of the Gulf of Mexico and in the harbors and bays of the towns along the west Florida coast on our trip northward.

It is beautiful to attain the quiet life, the simple life, like Burroughs in a country cottage, or like Thoreau in a cabin in the wilderness. But it is still more beautiful to be able to attain the quiet life, the simple life, mixed with the crash of city activities, surrounded by the hurry of the mart and the grind of the office.—"The Columbus Medical Journal," Columbus, Ohio.



FEEDING THE SCAUPS AT COCOA, FLORIDA.



ON THE INDIAN RIVER, FLORIDA

With the Audubon Societies.

NOTES FROM THE ANNUAL REPORT.

The Annual Report of the national association of Audubon Societies shows that this organization now has assets amounting to over \$400,000, about ninety per cent of which is credited to the endowment fund. Its income for the year just closed, with unexpended balance carried over from the year previous gave the society \$106,787.12 as a total available sum for its year's work. Of this amount, about \$80,000 was expended,—the greater proportion being for educational work in its various departments,—leaving a substantial balance at the close of its fiscal year, Oct. 19.

A new island has been purchased in Orange Lake, Florida at a cost of \$250. Boats now owned by the society and used in bird protection work aggregate some \$3,000 in value. A little more than that sum was spent in the egret protection work in the South, and has accomplished results of great value.

Reports of the various officers of the association; of field agents, secretaries of the state societies and wardens all seem to have a cheerful tone and show

large things accomplished the past year in bird conservation work, looking forward with bright prospects for the coming season. The new department of Applied Ornithology, under the expert guidance of the Rev. Herbert K. Job, is proving a great success, and showed a balance of about \$4000 at the close of the year's work.

Moving Pictures of Bird Protection Work.

Arrangements are being made by the national association to have some of the excellent moving picture reels of bird protection work, obtained by Mr. Job, exhibited in regular moving picture houses throughout the country. This should have a far-reaching effect in educating young people to protect, rather than to destroy, our native birds, as it will bring this work before thousands of people not reached through the ordinary channels of the Audubon Work.

If Nature you would know,
You have not far to go;
The nearest road, or left or right,
Will bring her breezy realms in sight,
And lay her portals low.

—Emma Peirce.



THE FAMOUS WILLOWVILLE SLOUGH ON THE DOMINQUEZ RANCHO.

Migratory Birds on the Dominquez Rancho.

BY ALFRED COOKMAN, EX-PRESIDENT OF THE LUTHER BURBANK CHAPTER OF THE AGASSIZ ASSOCIATION IN THE UNIVERSITY OF SOUTHERN CALIFORNIA, LOS ANGELES, CALIFORNIA.

In early October, several members of the Luther Burbank Chapter of The Agassiz Association established in the University of Southern California journeyed to the Dominquez Rancho, twenty miles south of Los Angeles and four miles north of the city of Long Beach in Los Angeles County, Southern California, to study the migratory birds that are now visiting this area, and to collect a few specimens for scientific study.

The Dominquez Rancho all told covers twenty-four thousand acres of land. It extends from the inner harbor of San Pedro, situated in the southwestern section of the Rancho proper, to the city of Gardena six miles northwest to the foothills of Long Beach located in the southeastern part of the Rancho proper and about eight miles southeast of Gardena. It forms the northwest boundary of the city of Long Beach.

"Signal Hill" is a peak towering above the surrounding foothills. From its summit one can view the Alamitos Bay territory and the canals of Naples. The Los Angeles River meanders among the willows and the cottonwoods in the southwest section, diagonally northeast, then southwest to the sea.

The Dominquez Rancho is considered by many of our western ornithologists as one of the greatest bird retreats in the southern division of California. One of the greatest fields for ornithological research on the American continent is located on this area. "Nigger Sloughs," a great marsh locality, is situated four miles north of San Pedro and seventeen miles south of Los Angeles. It comprises five large lakes and covers eighteen hundred acres of land. Thousands of marsh birds visit this area during their migration, and several species are permanent residents. There are several small marshes adjoining the main lakes that are rich with vegetation—tules, cottonwoods and willows. Going among the tules and beneath the overhanging vines, one may imagine himself in the

jungles of the Amazon, or on the banks of the African Congo. The beautiful sea birds, birds found in bays and marshes, and the game birds of the Pacific Coast linger in this locality to feed on the insects, the crustacea and the molluscs that here abound. Many varieties nest here.

Several leading gun clubs have taken advantage of these lakes, and have leased large portions over which to shoot the wild ducks that visit us in the fall of the year.

During a visit to North River Slough, one of the largest of the five lakes, we recorded twenty-five species and nearly three hundred individual birds. Among those most interesting was the northern phalarope (*Phalaropus lobatus*) of which a large flock was observed feeding at the edge of the lake. In the group we counted fourteen individual birds. They are a common migrant along the coast and on inland bodies of water. The writer took an adult male October 12th—a late record.

The black-necked stilt (*Himantopus mexicanus*) is a common summer resident. We did not expect to record any of these long legged stilts, but on the northeast section we counted six. They are rare in winter. The writer has taken sets of eggs of this species for the museum in May and June.

The avocet (*Recurvirostra americana*) was heralded with surprise. We have never been so fortunate as to locate this species at Nigger Slough. Dr. Brown of Washington, D. C., who is spending his winter in Los Angeles, informed me recently that he has taken several adult specimens this year at North Slough. They are common in marshy districts during migration. We counted three feeding near the "little hill."

Among other interesting species we recorded the American bittern (*Botaurus lentiginosus*), the American coot (*Fulica americana*), the Bonaparte gull (*Larus philadelphia*), the California and the western gull (*Larus californicus* and *L. occidentalis*), the western sandpiper (*Ereunetes mauri*), the beautiful marbled godwit (*Limosa fedoa*), the greater yellowlegs (*Totanus melanoleucus*), and several varieties of song birds, ducks, terns and grebes.

The writer is preparing a treatise on the aerial fauna of this region and is being assisted by members of The Agassiz Association that reside in Los Angeles and its vicinity.

Greenland Wheatear at Manomet, Massachusetts.

An adult Greenland wheatear was observed by Judge Charles F. Jenney of Hyde Park, on September 16, 1915, along the boulder-strewn shore of Manomet Beach, Massachusetts. This bird was studied at close range for twenty minutes, giving the observer ample opportunity to sketch and note in detail its markings and characteristics.

This is the second instance of the wheatear appearing in Massachusetts, the previous record being in September 1910, and there are four records of its occurrence in New York. It rarely, however, appears anywhere along the coast of the United States; its usual route of migration carrying it across the North Atlantic, through the British Isles and France, southward to the northwestern part of Africa, its winter home. It returns in the spring over the same route to its nesting grounds within the Arctic Circle and is said to be the only small species of land bird still following this ancient route.



TAKING NOTES AMONG THE CACTUS ON THE DOMINIQUEZ RANCHO.

Nesting of the Yellow-Tailed Tit.

BY H. STUART DOVE, WEST DEVONPORT,
TASMANIA, AUSTRALIA.

The yellow-tailed tit belongs to a genus (*Acanthiza*) which is peculiar to Australia and Tasmania, and includes about ten species. They are placed in the family of warblers, and the approved trivial name is "Tit Warbler," which suits them well, as they have the ever-moving, restless ways among the leaves and twigs which characterize the true tits (*Paridae*)—such as the American chickadee,—while at the same time most of them have the habit of uttering a sweet little strain like the warblers. To the Colonial boy, however, and to the great majority of the bush-dwellers, this particular species is simply the "Tomtit" or the "Yellow-tail," being known to scientists as *A. Chrysorrhea*.

He is a wee little fellow, under four inches in length; very neat in his plumage—olive-brown above; yellowish-white beneath, his dark forehead spotted with white, and a light line over the eye. The base of the tail and upper tail-coverts are bright yellow, and this contrasted with the dark, terminal band makes the bird very conspicuous as soon as he takes wing.

The tom-tits are gregarious during autumn and winter, feeding in the trees and bushes, or often on the ground, in small companies, but early in the spring these companies break up—each pair then entering upon the serious duties of life.

The nest is a rather bulky structure for such small architects, and often loosely constructed, but individuals vary greatly in this particular. It is domed; has a side entrance, and is built mostly of grasses, warmly lined with plentiful feathers,—those of the domestic fowl being much in favor. The structure is seldom placed more than eight or nine feet above the ground and is suspended from small branches or stout twigs;—the grass, or sometimes pieces of twine, being worked around the twigs until a secure hold is obtained. A favorite location about here is amid the drooping foliage of the white gum (*Eucalyptus viminalis*), where it is impossible to see the nest among the thick leafage until one gets against the tree trunk and looks upward, when he may—if he has beforehand a pretty good idea as to its situation—be able to "spot" it.

About my own place this gum foliage,

in one tree or another, is used every year, while at a friend's place over the river a pair of yellow-tails builds each season in the swamp tea tree (*Melaleuca cricefolia*) just back of his cottage. This tree is of an entirely different habit from the drooping white gum, being stiff and upright with short, linear foliage—more like pine-needles,—so that individualism shows here as well as in the mode of nest-construction. At a locality a few miles past my friend's place, the prickly wattle (*Acacia verticillata*) is the tree selected, and makes unpleasant handling for would-be nest-robbers.

The "procreant cradle," swung in the thick leafage of a gum only a yard or two from my wood-pile, was constructed of soft, partly-green grasses, with a fair amount of green moss interwoven, and was plentifully lined with hens' feathers. It had the usual apical depression, called the "cock's nest" by the boys, where the lord and master is supposed to sleep while his mate is brooding. Whether he actually does so. I have not so far been able to ascertain, owing to the dense nature of the foliage in which it is situated. Three white eggs were laid, of the usual, rather elongated pattern with fine, glossy surface. As I did not find the nest until the eggs were deposited, the time of incubation was not ascertained with certainty, but it was at least fifteen days. The time from hatching to leaving the nest was nineteen days. This agrees with an observation on the same species which I made in Victoria (*Australia*), and is much longer than the time taken by our long-tailed wrens, which feather in eleven to twelve days. (A brood which I timed in Victoria left the nest on the tenth day from hatching).

The young tom-tits have a slight greyish down on the head and back when hatched; the eyes open about the eighth day, and on the tenth day the down has almost disappeared and feathers are sprouting well on the head and body;—the yellow on the short tail and rump showing distinctly.

Our yellow-tail is not infrequently victimized by the handsome little bronze cuckoo; of which two, and possibly three species visit us each spring and summer from the main-land of Australia. The eggs are practically the same size and much the same shape as those of the "tit,"

but the tint is different,—which of course does not matter in a covered nest. The peculiar whistling calls of these small cuckoos are among our familiar spring sounds.

A peculiarity of our "yellow-tail" is that it sometimes builds under and adjoining the nests of such fierce birds as the eagles, ravens and magpies. The latter is properly the "piping crow-shrike," one of our most familiar species, and so fierce at breeding time that I have seen it chase a hawk fully a mile from its nest, and occasionally it will even attack human beings who venture too near the tree—yet our little "tit" will sometimes brood under its protection. It would be interesting to know whether any of the small birds of America indulge in the same practice.

The Starling's Objectionable Habits. Meriden, Connecticut.

To the Editor:—

In the September number of this magazine you make mention of the investigation now being carried on by the Department of Agriculture, to determine the economic value in America of the European starling.

Before this work is completed, and the result of the inspection of hundreds of stomachs is made known, I believe that a collection of facts relating to the objectionable habits that I know, from actual experience, to be common to the starling, would be of importance in deciding the question, Shall the starling be protected or condemned? Many items have been published that describe the starling as an insect destroyer worthy of protection, and some observers consider the protected robin as an even greater destroyer of fruit, but personally I believe that the starling more than pays for the fruit it devours by the number of insects it destroys, especially tent caterpillars, grasshoppers and cutworms.

Other things might be mentioned in its favor. The beautiful plumage, appearing after the August moult, when the dull brown of the young bird is displaced by feathers of glistening black, with changing tints of purple and green, and each feather tipped with white, gives the bird a speckled appearance that may appeal to some nature lovers.

Their power of mimicry is interesting, but it is limited to short calls and whistles. I have heard them imitate the call note of the robin, the wood pewee, the grackle, the catbird, the flicker and the whippoorwill. How the starling could have learned the whippoorwill's night call is a question, but I saw the bird, at midday, perched near the top of a Norway spruce, and heard it thrice repeat to perfection the call, "whippoorwill."

But none of these interesting habits nor its insectivorous nature should save the starling, if we have enough evidence to prove its enmity for our native birds. The greatest sufferers are woodpeckers, bluebirds, martins and tree swallows. In fact, no species is safe that builds in a hollow tree, or in a hole, or in a bird house that the starling can enter. The native bird is driven out and the site taken for the starling's own use, or, if the starling has already made its nest, it will visit such places to rob the nests of eggs or of young birds.

Other objectionable habits are its destruction of sprouting and ripening grain, its habit of making holes or of nesting in or about buildings, and, after the nesting season is over, the habit of roosting in large flocks in a tree by the wayside where they make themselves disagreeable, especially in the city.

The examination of the stomach contents of starlings captured in various localities and at all seasons will determine the proportions of animal and vegetable matter consumed, and prove or disprove their economic value. But it will not make known the number of flickers that have been driven from their holes, nor the hundreds of martin boxes and bluebird boxes that have been occupied by the starling before the desired tenants arrived. The child that has witnessed such incidents has more convincing evidence against this imported bird than has the professor with his microscope. The starlings are increasing rapidly, and many of our native birds are about as rapidly decreasing.

If the reader has witnessed any undesirable habit of the European starling and will report to me. I will assemble the evidence and forward it to Washington. We can all thus take

part in preventing what is likely to become a greater pest than the English sparrow.

L. W. SMITH.

The gathering of such material should be of interest and value. Will not our readers cooperate and send to Mr. Smith, 60 Cottage Street, Meriden, Conn., their observations of the starling's habits, both pro and con, to be summarized for a later report to this department?—H. G. H.

That Mysterious Little Bird.

Bartville, Pennsylvania.

To the Editor:

From October 15th to 17th a small bird was seen among the alders that line the swampy part of a dam. It was not larger than the English sparrow, and was quiet in every motion. We stood perhaps six feet away and it showed no fear. It was mottled greenish yellow, with the shoulders between the wings a downy, pale brown quite distinct. So much white was on the wings and the short tail that I said at once of the new bird, "It is a crossbill." But we could see that only the little bill was curved—the upper mandible. The bill was not stout but appeared to be pointed at the tip. As the bird seemed immature and the tail very short, I thought it might be a white-winged crossbill without the decided cross. After looking in my bird guide and other books, I decided that I did not know what to do about that little tail with so much white that it appeared to be of white-edged black feathers, the black showing also on the wings. We feel sure it was not a goldfinch although its lower wings and wee tail resemble those of the goldfinch as pictured. While we guessed at the pine siskin, it did not resemble those that we have occasionally seen. Its body and wing coloring were like those of the female white-winged crossbill. When it was feeding on the alder cones, we noticed that the bird gave a twist in extracting the seeds. When moving from one branch to another it spread the little tail (one inch long or a little more) fan fashion like the redstart. I saw it two days later eating the seeds of the bitterweed (ragweed). At no time, even when flying, was it more than a few feet high; it fed low, flew low, of its kind was a solitary bird.

There were many other birds about the hillside and along the water, but it kept

to itself, and seemed fearless. Is it possible for you to name it? It has greatly puzzled me. I am familiar with a hundred land birds, but not with all the young. It was not a goldfinch, nor, I think, a siskin.

Yours,

MRS. D. W. JACKSON.

The bird was probably a pine siskin, although these usually travel in flocks, as do the goldfinches and the redpolls. It is often difficult to note the distinguishing characteristics of a bird so that we can afterward positively identify it, as in varying lights and attitudes the colors and form seem to differ.

The size, general markings, sharp bill and feeding habits, in this instance, all point to the pine siskin. The light, yellowish white markings both on the wings and the tail show conspicuously when they are spread and are entirely concealed when they are closed. There is also considerable variation in the markings among individual specimens.—H. G. H.

Owls Make Attacks on Heads.

A naturalist living in northern Canada opines that the animal of the region most dangerous to man is not the moose, rattlesnake, bear, cougar or lynx—but the great horned owl.

The bird, sitting aloft in the gathering dusk, mistakes fur cap or human hair for some small creature on the ground. Thereupon he drops silently down, and before he finds out his mistake, he has driven eight inch-long talons into somebody's head. In some lumber camps, report is, the men actually have been forced, when they go back and forth in the evening, to carry boxes or barrels over their heads.

State Parks Made Bird Reservations.

The necessary legal steps have been taken by which the fine state parks of Wisconsin have been made into bird reserves. This will be of great value in preserving all kinds of bird life, and especially important in view of the threatened extermination of certain species.—Boys' Life.

GILLIES.

Gillies, frosted, dainty, sweet,
Grace the border of the lawn;
Glowing, as though clusters neat
Caught the first flush of the dawn.
—Emma Peirce.



EDITORIAL



Guidance to Common Pleasure.

Not far from this office, the road has for several weeks been torn up. The new concrete road will be a delight, especially to automobilists. At a considerable distance from the place a sign has been erected and gives the detour route to Stamford or to Greenwich. Imagine the driver of any one of the hundreds of automobiles that pass over the road in a day, coming to that sign and pondering it long, with disparaging remarks about the authorities that put it there! Suppose there should come a philosophic chauffeur and he should further question the right of the masters of Greenwich and Stamford to erect such signs to detract from his pleasure in going straight forward on the road over which he wishes to go.

Imagine the absurdity, if such a chauffeur should still further question whether or not it were wise to improve the road; it never had been improved in the past, why try to improve it for the future.

The dummiest chauffeur that ever lived, if he thinks at all in the matter, will say, "That guidepost will temporarily swerve me from my present road and take me over a less pleasurable one, but it is for the ultimate good of all that pass this way. I may never come over this road again, but I perceive that the process now going on here, as indicated by this sign, while it brings me present annoyance, will in the future afford great pleasure to many chauffeurs and to their passengers."

How many times in recent months have we heard it said that there cannot be a God—if there were a God, He would stop the horrible war now raging in Europe. This is only applying to nations what many have said about death in their own family or of pain long suffered.

To the writer it seems that this great war is only a guidepost to point out the road that the nations in the future

shall follow for the benefit of the human race. This may not be for any of the travelers that are now passing over old Mother Earth. It will be for the comfort of the future, but how far in the future, no one knows. In His sight a thousand years are as one day, and one day as a thousand years.

How did that chauffeur know that the guidepost indicated a terrible upheaval of affairs that would lead to future comforts? By using his common sense, he had observed that a little tearing up of a road makes a little discomfort followed by only a little improvement. He had likewise learned that when a long stretch of road is torn up for a long time something radically better than the old will follow. The war in Europe more and more plainly indicates that God is doing a tremendous work in behalf of the human race, though it must be admitted that it is at present a mighty discouraging and painful operation. Things are so generally torn up that there is no comfort in traveling in any direction.

So it is with pain and bereavement in a family. The Divine processes are long, they extend far into the future, where love will probably be all the stronger; the greater the present sorrow, the greater the future joy. Pain may inconvenience and discomfort for the present, but it is a guidepost that always has been and always will be pointing to better things. Every pain that every person bears means that somewhere in the individual life, or in the life of some ancestor something has been done wrong. Every one in perfect present health and comfort is reaping the reward of the pain and death of the past.

This rule applies unerringly to nations as well as to individuals. We hear many say of the war as they say of the great and seemingly cruel struggles of Nature, "There is no God." But, like the chauffeur, one must think far beyond the present, and stop to

read the sign that directs to the great changes for the better that shall come in the future.

It is true, as John Fiske remarked, that "Every daisy field is a scene of carnage worse than that of any Waterloo," but every daisy field of the present is the result of the carnage of the past. Every protective Government, and every healthful enjoyment is the result of the carnage of the past.

History tells us of the cruel suffering in the wars between the Whites and the Indians that occurred in our own vicinity. Only a few rods from where I am dictating this article, is the Congregational Church to which the men, only a comparatively few decades ago, carried their rifles when they went to the church service. Those were times when faith was strained to the breaking point. Rifles, war, the possibility of death in God's House! Would one be surprised if some of those good people had lost faith and had said, "There is no God to protect us from the tomahawk and the scalping knife—nothing but our own power and bullets!"

But out of it all has come a better race, a better Sound Beach with better protected homes, with better laws and better order everywhere.

Would it have been possible for even Omnipotence to develop a world in any different manner? Could there be happiness in a world in which unhappiness is impossible? Would not the monotony be painful? Could there be any righteousness in a world in which sin is impossible? What may be in some other world or in some other state of existence no one knows. This dictum is intended to apply only within the scope of that human earthly horizon.

As I look out of the window I see a long ridge of earth and two conical mounds on the golf links. Why do not the golf players remove those things? They leave the obstructions for the future satisfaction of overcoming them, and of getting the ball from one end of the links to the other. If I were to ask such a question, I should be laughed at: "Do you not know that we have just added what you call haystacks of turf? We want to make playing not easier but more difficult. Our pleasure is in exercising skill in overcoming obstacles." A life without ob-

stacles would not be worth living, and a painless life could never afford real happiness. The greater the upheaval of the road, the greater will be our future comfort, convenience and pleasure.

Be Frank, even if Not Interested.

Not everybody is expected to be interested in the study of nature. If everybody were interested, there would be no need for some phases of the work of The Agassiz Association. But it is strange that many people who are not in the slightest degree attracted try to imply that their interest in nature is supreme. I recently called at a school where, so far as I know, there is not a particle of nature study in the programme. Said the principal, "I readily recognize the great importance of nature study for these young people. Indeed, I think nothing better can enter into their lives. Why, I recall that when I was a boy I was influenced more by nature than by anything else, and I recognize that you are doing wonderful work," and so on, and so on, commending *ad infinitum*, it seemed to me, stopping hardly long enough to catch his breath.

"How much time," I asked, "do you devote each day to this subject, or how much time would you be willing to devote to it?"

He said, "We have no room for it in our curriculum. I wish you could see what we are doing. We are already overcrowded and there is not a minute to spare for any of your kind of work."

"Do you have any nature study in the school?"

"I should like to have a lot of it, but we have no time for it."

I do not hope to live long enough to convince that man of the importance of nature study, but I might perhaps convince him of his lack of frankness. He is not honest with himself. His remarks amounted to this: "There are many subjects to be considered in the school. We have everything except nature because we consider that less important than any other."

I recently handed a man a sample copy of *THE GUIDE TO NATURE*. He went into ecstasies and poured forth a volume of grateful expression for an occasional copy of this "beautiful little magazine." He said, "I think it is the

most delightful publication I have ever seen. I and my wife enjoy reading every word of it and looking at your wonderful photographs. You are indeed to be congratulated upon such success."

"May we have your dollar to enroll you as a subscriber?"

"Oh, no, no, no," he said. "Our house is already crowded with magazines and papers. We have no time to do justice to half of them."

My dear sir, you are a long way from being a naturalist, or from the proper appreciation of our "little magazine," and you are still further astray from the home of frankness. Your remarks so completely disprove what you intend your words to convey that your remarks are painful. What you really said is, "There are a large number of magazines and newspapers, and of them all I regard your magazine as the least important."

A young man came into my home a few years ago and requested me to show him the microscope. I think that he was really interested and I should have been pleased if he had said so, but because he knew my interest in the subject he thought that nothing short of the highest laudation would gratify me. He said something like this: "I have been longing for several months to get a microscope. It is the height of my ambition. I think that I could get more satisfaction and pleasure out of a microscope than out of anything else in this whole world. I am going to buy one just as soon as I can, because I know that there is nothing better."

"Well," I said, "why not? The cost in these days is not great. Why not?"

"The trouble is that I have not money enough. What would a really good microscope cost?" I replied that almost any amount from forty dollars to seventy-five dollars would get a satisfactory equipment. He said, "I have just sixty dollars."

I congratulated him. "You are able to realize your wish. Send in your order at once."

"Oh, no, no, no," he replied. "I could not think of doing it now. I am saving my money to buy a bicycle." This was when a good bicycle cost one hundred dollars. About two weeks later I saw him with a fine bicycle, but

for several years he continued to assert that he knew of nothing in all the land that would afford him so much enjoyment as a microscope. So far as I know, he has not yet obtained it. I do not blame him for selecting the bicycle if he liked it better, but I deplore his lack of frankness. His courtesy and appreciation would have pleased me more, if he had been more truthful. It is his habit of mind that I deplore.

If I were a Salvation Army worker and should meet a Congregationalist, I should not expect him to say, "I think that your association is the best in the world. If there is anything that I desire to become it is a worker in the Salvation Army."

If I were a Democrat, and a Progressive should meet me would he say as a matter of courtesy, "If there is anything in all this land that I desire to become, it is a Democrat?"

Then in the name of common sense why does everybody because I am a naturalist say, "I think there is nothing more delightful in all this world than the study of nature. We all know that it is a wonderful subject. It must be ideal to live among such wonderful things. I envy you every minute of your time!" As Shakespeare more than once remarked, "Go to!"

My friend, I am telling you impersonally because it would not be courteous to say it individually. Before you manifest an interest in anything, study the good old-fashioned quality of frankness.

If you were to go to the home of a musician, the greatest compliment you could pay him would be, "Please let me have some of your music. Please play for me." Why do you not use ordinary common sense when you visit a naturalist? Why do you hurl yourself through the doorway and say, as you consult your watch, "I know that you are a busy man. I would not think of taking any of your valuable time so I am going to stay just a few minutes. And, indeed, I have to catch a train." Why come if you come only to go?

What is desired by a naturalist in charge of an Institution like ARCADIA is to have a visitor show that he is reluctant to go away. We wind here the great hunting horn of nature, and the longer you stay to hear the music, and

the more you seem to enjoy it, and the greater is your evidence of appreciation, the longer we like you to stay. Come repeatedly, stay a long time, and if you enjoy the music we shall be glad to give it to you. On the outside the world is rushing. Do not rush in ARCADIA. And above all things, tell the truth in both word and deed.

Science in Journalism.

[FROM THE LITERARY DIGEST, NEW YORK CITY.]

The American people do *not* care enough about sound and reliable scientific information to pay what it is worth. We are content with the pseudoscience of the daily paper and an occasional sensation of doubtful value in the monthly magazine. This somewhat pessimistic pronouncement is made editorially by our best scientific magazine, *The Popular Science Monthly* (New York, September), in announcing its future differentiation into two separate publications. This statement is based on the fact that almost every serious publication in the United States, designed to give scientific news and information to the non-technically educated citizen, has lost money, and is still losing it. The editor believes that this condition is inevitable and that such magazines, if they continue to exist, must always show a deficit to be made up by individual contributions or by scientific organizations—now the more usual method. Says the magazine named above:

"In a democracy, journals and a newspaper press fit to educate people of all sorts to an interest in science and to an appreciation of its measureless value for national and human welfare are matters of the utmost importance. Under an aristocratic régime, science, like arts and letters, must be cultivated and patronized from above. In Germany the Imperial Government has directed and subsidized its schools, universities, and research institutions, and has aided commercial enterprises based on applied science. In England 'men of wealth have devoted themselves to scientific research, as they have served without payment as county magistrates and members of Parliament. In both countries and in France titles and social position have been used as rewards.

"Scientific research can not be undertaken as a profession. In the existing organization of society any service to an individual or to a group of individuals is paid for by them, but service to society is usually not paid for at all. If newspaper publishers, ammunition-makers, or army officers succeed in causing war they profit; if they advocate and maintain peace they suffer. If lawyers reduce legal complexities and delays, or if physicians decrease the causes of disease, they sacrifice their material interests. **If a surgeon performs an operation for cancer he may be paid a thousand dollars for an hour's work; if he discovers an improved technique he may profit somewhat, but scarcely more than other surgeons and far less than the patients; if he should discover a cure for cancer he would receive no money-reward; on the contrary, he and other surgeons would in so far lose their means of supporting their families.**

"**So scientific research, of greater value than any other service to society, is not paid for directly.** It has been mainly carried forward in this country by men employed to teach in colleges and universities who, as amateurs, give part of their time to it. In recent years the national Government, endowed institutions and industrial establishments have undertaken to advance research on a business basis and the gain has been very great. But in order to maintain and increase the work under democratic control, people must be taught to value it, and for this purpose the proper treatment of science in magazines and newspapers is more important than any other agency.

"The problem is very difficult. One does not expect a high school, a university, or a museum to be self-supporting. Even secondary schools for the children of the rich are endowed. If the American Museum of Natural History charged an entrance fee it would be an empty place; the fees for a year would not support the institution for a month. On the other hand, the side-shows of a circus may be profitable. Science is so commonly ill-treated in popular magazines and newspapers that the very words 'popular science' need to be redeemed. The sensational newspapers, the side-shows of the circus, and the

'movies' supply what people will pay for. It is no discredit to our democracy that these are what they want; on the contrary, it represents a great advance when a hundred million people care for such things. We may be satisfied if progress is made by education and an improved environment in a hundred years if a slightly better germ-plasm is established in a thousand years.

"There are over a hundred journals and proceedings devoted to the publication of research-work in America not one of which pays its expenses on a regular business basis. Magazines connected with applied science and popular mechanics may do so. This represents a step in advance, which we may hope indicates that ultimately there may be a general interest in other and more fundamental departments of science.

"It would probably be undesirable for scientific journals to be directly subsidized or endowed. Indirectly they are now subsidized by the work of contributors and editors supported by endowed or tax-supported institutions and by subscriptions from public libraries. In so far as they require additional support, it can probably best come through an increase in the number of public libraries subscribing for such journals and by an increase of subscribers among those who may realize the importance of supporting an institution essential to society and its betterment."

"Would You Like to 'Come Up Again?'"

A prominent resident of Sound Beach asked me this question as I boarded the trolley car in which he was sitting. A little girl about eight years of age had entered the car just ahead of me, and as I stepped in he asked this astonishing question, "Would you like to be at that age and come up again?" He said that he had made the suggestion to many people, but had not yet found one that would like to live over even one day of his past life, and added, "Life is sweet, but it is chiefly so in anticipation. I believe that none of us, no matter how happy the past has been, would exchange one day of the present nor one day of the future for

the sake of living over any part of the past."

Mingled with a feeling of pathos and yet with joy that well-known quotation from Omar Khayyam, the Persian poet, came into my mind: "The moving finger writes, and having writ moves on." The unwritten part of the page offers as much joy as anything in the past or present and, in addition, there are the possibilities and always the possible variations.

Such a point of view is encouraging to the naturalist. The achievements and the knowledge accumulated in the past are rolling up like a big snowball and offering us untold wealth in our ability to appreciate the things of nature.

To say of a child, "That is the best part of life," is equivalent to saying, "A little development of brain and body is better than much." We have learned a little, and let us go and learn more.

To the naturalist, in the Indian Summer of his age, "The moving finger writes, and having writ moves on," are delightful words. Mr. Philosopher, would you like to "come up again?"

A Study in Psychology.

Recently in showing the work of the projection microscope to a company of visitors in the Welcome Reception Room, I thought to make it clear that real specimens are used in the projection microscope. I took up a pocket lens and a slide on which was mounted a dragon fly's mouth, and called a boy of about five years of age to look through the lens and describe the object to the company, making it clear to him that he was to observe the mouth of a dragon fly. The point I wished to make was that what he saw by direct observation the entire company would see later by projection, and he should thus prepare them, excite their curiosity, and make clear that a projection microscope was used to save time. He seemed much interested in what he saw through the pocket lens held in my hand above the slide. The slide showed a number of formidable looking "teeth" in the jaws of the dragon fly. Thinking him properly impressed with the device with which these insects eat mosquitoes, I said to him,

"Now tell us how it looks." With all seriousness, in tones of awe, this boy, aged five years, said: "It looks like the very devil!"

My first thought, and probably that of some in the audience, was that this boy came from a home where profanity in a mild form was not unknown, but from the manner in which he spoke, and from facts that I learned from further questioning, it appeared that dragons and fairy book devils had become confused in his mind. Perhaps, too, I had increased his misunderstanding as I had explained to the children what the dragon fly is, and that many children know it as the devil's darning needle and give it a reputation for sewing up mouths and ears. With the boy it was an attempt toward a serious description. To say that it looked like the devil was to him as harmless a description as to say that it looked like a horse or a dog. I hope the children enjoyed the study of natural history as much as I enjoyed the study of child psychology.

An Appreciation of Mr. Burroughs.

West Devonport, Tasmania,
Australia.

To the Editor:—

By the August number of *THE GUIDE TO NATURE* I was pleased to see that the veteran naturalist, Mr. John Burroughs, remains in good health. As you are one of his correspondents, please tell him that I have spent many pleasant hours with his charming nature books, which I have for years possessed in the pocket edition. In "Birds and Poets" I have favorite passages scored all through the book, also in "The Return of the Birds" in "Wake-Robin," and "Sharp Eyes" in "Locusts and Wild Honey," with many others. Mr. Burroughs may be pleased to know that his writings are appreciated in this Ultima Thule of the South.

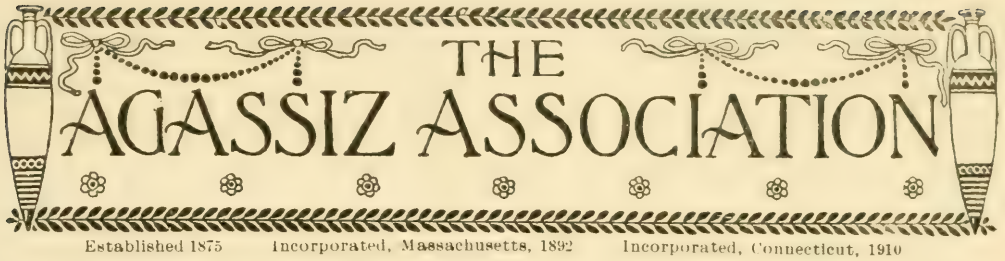
I can endorse the statement that eggs are poisonous to some constitutions; they have a deleterious effect on me if taken more than very occasionally, apples likewise unless of a soft, easily digested variety. Many people consider raw apples a soporific; with me they have the opposite effect, inducing wakefulness and unrest.

H. STUART DOVE.

Spots Before the Eyes.

The prevalence of this condition has given rise to a great many curious ideas. Almost everyone either sees fixed or floating spots at times, or hears some friend complain of these conditions, so that it is not strange that many popular misconceptions have arisen. The commonest form of floating spots are those which are known by the name of *muscae volitantes*, an old name which indicates how long the condition has been observed. These are tiny transparent chains, or strings, which are seen especially on a white or brightly illuminated field. They persistently float in the line of vision, and though a shake of the head may carry them out of the way, they at once float back again. These spots are probably caused by the remains in the fluid part of the eye of certain cells which should have been completely absorbed in the development of the eye. They never lead to impairment of vision and, as before stated, are perfectly transparent. Other floating spots are due to cobweb-like masses of inflammatory material which are thrown out into the fluid of the eye by some low grade inflammation. These spots usually obscure the vision, which is their great point of difference from the former ones. It is, of course, very important to find out in any case whether the spots are due to inflammation, or not, and this can only be done by a skilled observer. It is a prevalent idea that the wearing of a dotted veil may leave permanent spots in the field of vision. While the dotted veil may be a source of strain by causing the wearer to pull on the eye muscles in order to avoid the obstruction of vision, it certainly is not the case that the dots, or any other object seen, can be permanently photographed on the nerve tissues of the eye. There is only one exception to this statement. Many people who have carelessly looked too much at the sun, generally in observing the eclipse, have actually produced a slight inflammatory change in the retina, so that there is always a blurry spot wherever they look. But it is doubtful if any light less brilliant than the sun can produce a permanent spot, and certainly a dark object can not do so.

—*Jour. Am. Med. Asso.*



Necrology.

George Lauder, Jr., a nephew of Andrew Carnegie's, a Member of The Agassiz Association, a native of Pittsburgh, died in his thirty-eighth year at his home in Rock Ridge, Greenwich,



GEORGE LAUDER, JR.

Cut by courtesy of "Our Town," Greenwich, Conn.

Connecticut, on Tuesday morning, January fifth, of a sudden attack of pneumonia.

Mr. Lauder held a number of prominent positions in the business and social world. His principal form of recreation was yachting, but he had a general interest in nature, with especial reference to photography in all its branches.

By his personal cordiality and numerous acquaintances he endeared him-

self to many people and to many institutions. He was a liberal contributor to The Sound Beach Astronomical Observatory, but never visited it, although as he stated by letter he intended to do so "in the very near future." One of Mr. Lauder's most generous gifts in behalf of education was \$400,000 given to the medical school of Yale.

In his death The Agassiz Association loses a much esteemed member, and the town of Greenwich a much beloved citizen. He leaves a wife and three children.

A Local Bird Sanctuary.

It is a delight to learn that in our own town is to be established probably the largest and most effective bird sanctuary in the country. This is to be on the estate of Mr. E. C. Converse of Greenwich, where a tract of almost two thousand acres is to be set apart for the purpose, with houses and other means of protection for the birds. The work will be in charge of an expert ornithologist from the Massachusetts Agricultural College, and will be done scientifically, with records and definite data, so that the progress may be carefully watched. Every bird lover will hail with delight the establishment of this sanctuary. Doubtless its success will lead to the establishment of many such sanctuaries. The birds are now coming to their own. It is good to be living at such a time.

My plea then is, not so much against nature study and agriculture, as for the sciences first. These can be taught as elementary as may be desired, and in properly teaching them we are giving instructions not only in agriculture, but also in dozens of other arts or practical fields in which the pupils thus become prepared later in life, if they wish.

CORRESPONDENCE AND INFORMATION

"Bottle Pigs."

Flemington, New Jersey.

To the Editor:

One of our Chester White sows farrowed a litter of seventeen pigs on April 9th, and died two days later, leaving a family of ten, two of whom soon followed her. A post mortem revealed the fact

warm water and a bit of lime water afforded just as good a dinner as "Mother used to make." The following day they were fully reconciled to the change of diet, and all the members of the family delighted in feeding them. The quantity was gradually increased from twelve ounces every three hours on the first day, to sixty-four



MRS. DEATS AND THE "BOTTLE PIGS."

that she had died literally of a broken heart, but whether from the largeness or smallness of her family was not determined.

The babies were apparently a healthy lot, so it was decided that they should be raised by the bottle method. The small boy was dispatched to the drug store in town for a supply of rubber nipples, and as it was "Sunday off" for the man who takes care of the pigs, "the Boss" spent most of that rainy day trying to persuade those pigs that a mixture of Jersey milk,

ounces (three-fourths whole milk) four times a day, divided as equally as possible between rising and bedtime, until they were four weeks old. Then skim milk with a little wheat shorts was substituted, and they were fed, pig style, from a small trough, and allowed the run of the barn yard.

After the first week, instead of handling each one separately, as shown in the photograph, holes were bored in the side of packing boxes, a sloping floor nailed inside, and the pigs gathered around the

festive board. This device was a great time saver.

Those eight pigs differed just as much as any family of that size. There was the lazy fellow who took his time and that of all the rest, while at the other extreme was his larger brother, who might have been trained at the traditional railway lunch counter. Another reminded me of a man who worked for us when I was a small boy, who "could eat a canal through mashed potatoes and gravy." And then there was the quiet little sister, perfectly content to wait until all the rest were fed, before she came to the table.

I have been told that each pig has its own place at its mother's dinner table, and the actions of this lot when it was necessary to substitute a new rubber nipple indicates that this opinion may be correct.

We found that getting up by the alarm clock in the middle of the night was just as strenuous as conducting a cow test for advanced registry, but now that it is over, and our pigs are growing, we are glad we tried to save them. "The only way to learn how to do a thing is to do it," and then "tell the neighbors;" hence this letter.

H. E. DEATS.

The foregoing lines were penned "in the pleasant month of May." As I sit on the top rail of the orchard fence this chill November morning, and watch that litter of pigs, a bit of current slang seems to express my opinion. "Never again" will we take the trouble to bring up a family of orphan pigs. When we figure the time and material lavished on them, and compare them with another litter of eight of the same age, there is no doubt of our failure, from the commercial standpoint.—H. E. D.

How were These Trees Planted?

West Devonport, Tasmania,
Australia.

To the Editor:—

It is fascinating to speculate on the various methods by which the flora of a country was conveyed thither by purely natural agencies, before civilized man came upon the scene and mixed things up so indiscriminately as he has done. Even now, if we keep our eyes open in our wanderings, we may at times see some of these methods, or their recent results.

Early last month, while pushing through some scrub of boobyalla and beyera on this coast, I came upon two small trees of the Victorian hedge laurel (*Pittosporum undulatum*) growing among the tall bushes. The only previous record of the tree's spontaneous growth in our island was made by Mr. Emmett, years ago, while he was superintending the cutting of a track through the forest adjacent to the Arthur River, one hundred and fifty miles to the west. Although Mr. Emmett searched over a considerable space, he was able to find only the solitary specimen. The question arises, How did these widely separated trees get here? Wind as the agent is out of the question; so, to my mind, is water. We must put aside the improbable supposition that the small seeds might have floated across two hundred miles or so of sea from the Victorian (Australia) coast, since the plants, which were growing near the beach, were too high above the tide mark to have been thrown there by the waves. In the case of the Arthur River specimen, it is more improbable still, as the river has a swift current always flowing down through wild bush country. Naturally I thought of bird agency, but all our migrants from the mainland are insectivorous, except the waders, and they live on worms, small crabs and mollusks. On this subject I consulted Professor Ewart, Government Botanist to the State of Victoria, and he gave it as his opinion that, as the seeds of the *Pittosporum* are sticky, they would readily adhere to the feet of our migrants, if such happened to perch on trees with ripe seeds, or on the ground where the seeds had fallen. This, I think, is the correct solution, especially as one of the small trees was growing up through the centre of a large boobyalla bush (*Myoporum*) in just such a situation as it would find if the seed had been rubbed from the foot of a bird perching in the bush, after its flight across the intervening sea.

If you consider this note sufficiently interesting, you are welcome to print it; it may elicit other instances from your readers.

H. STUART DOVE.

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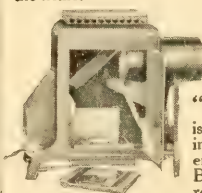


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The Guide To Nature

1916

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A Poor Substitute.

Robert, the four-year-old son of a scientific man, had lived in the country most of his short life. One day a caller, wishing to make friends with the little fellow, took him on his knee and asked: "Are there any fairies in your woods here, Robert?"

"No," responded Robert promptly; "but there are plenty of edible fungi."

—"Youth's Companion."

His or Her Ownership of a Part of a Cow!

Below is given a copy of an inscription that adorned a board fence in Kent:

"Notis—If any man's or woman's cows get into these here oats, his or her tail will be cut off as the case may be."—The Country Gentleman.

A Study in Psychology.

Teacher: Who can tell me which is the index finger?

Bright Boy: It's the one you lick when you turn over the pages.

—"The Country Gentleman."

A Pleasant Surprise for ArcAdia.

The Reverend Dr. Lewis W. Barney called at ARCADIA at the beginning of the new year and presented a magnificent punch bowl which bore the following inscription:

"For the Welcome Reception Room with New Year's Greetings from the Ladies' Aid Society of the First Congregational Church."

Spratt's trophy, consisting of two handsome sterling silver porringers, for the best brace in the 1915 shows, was won by Ridgeway Kennels' wire-haired fox terriers.

" . . . 'mid all this mighty sum
Of things forever speaking."

—Wordsworth.

THOMAS D. MAGEE

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A colored man was driving an old jog-trot horse toward the railroad station half a mile away. A man, walking rapidly in the same direction, asked for a ride. The colored man replied, "Dun know, boss, but I'se fraid I'll not get you dere much quicker dan you could walk it, 'cause I'se only got dis ole worn out war hoss."

The traveler, and old soldier, aroused by the remark about the war horse, said, "I think I can drive him better than you can. I am an old cavalryman myself."

"All right, Boss, take de reins." The soldier peremptorily shouted, "Attention!" Instantly the horse became alert with new life. "Charge!" he shouted, and down the street went that veteran horse at a speed never before known to his present owner. "Halt!" shouted the soldier as they arrived at the station. The horse stopped so suddenly that both occupants were nearly thrown over the dash-board.

The colored man was delighted to

learn that the horse possessed so much speed. The next day, going again toward the station he overtook another traveler in great haste, who asked whether such an old plug of a horse would make worth while for him to get aboard.

"Now, Boss, dun you worry 'bout dat; I can get you dere in time. Dis hoss is more speedy dan you think." The traveler got in. "Attention!" "Charge!" and away they went helter-skelter. Within a few yards of the station, the colored man showed some excitement. "Say, Boss, I spects you better jump, 'cause I'se clean forgot de word dat stops dis hoss!"

The Birds of 1916 Are on the Way.

It is now 1916. In a few weeks the birds will be here. This is about the right time to start your bird houses, so as to have them thoroughly in harmony upon the arrival of their prospective inmates.

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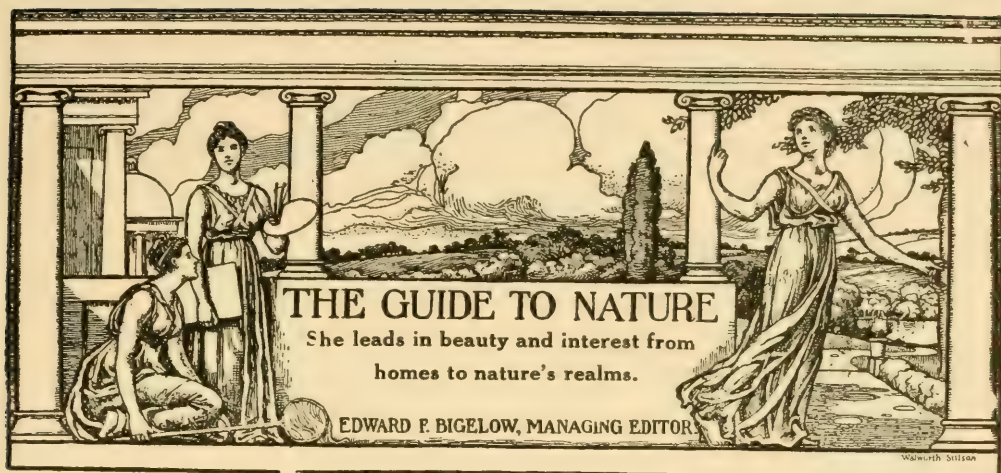
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MARCH, 1916

Number 10

A Stamford, Connecticut, Museum.

BY R. HERTZBERG, M. D., STAMFORD, CONNECTICUT.

Stamford as a good place to live in ranks well with other cities of equal size. Many institutions that bespeak the altruism of her citizens are maintained and supported by private subscriptions. We have to mention only the Stamford Hospital, the Young Men's Christian Association, the Ferguson Library, the Children's Home and the Day Nursery to realize that large sums are given each year for charity. These institutions are necessities, each one filling a place that no decent, self-respecting community can afford to leave unoccupied. We now propose to give Stamford something that will appeal to the æsthetic side of life. It is not a charity, yet if it is supported by the good will of the people, it will return an ample recompense alike to old and young, rich and poor.

Stamford is to have a Museum, if the contemplated plan find sufficient support. It is not purposed to place in some building a collection of various objects, dust them off occasionally for exhibition spasms, and then allow the grime to re-accumulate until the next excitement. That sort of institution is sure to become the charnal house of hope and efforts. What is needed is a live organization of men, women and children, who will be willing to give some of their time to the

work. Every one who is at all interested in making this life fuller and richer for others, and in making Stamford a still better place to live in, should become a member.

The plan is to organize the Stamford Museum Society, the dues to range from a Life Membership at five hundred dollars to an Annual Membership at two dollars, thus enabling all to join and to regulate their own expenses. When members enough to assure an income of twenty-five hundred dollars a year have been secured, the Museum will be organized and incorporated. The society will own all collections given to the Museum. From among its members shall be formed the faculties to govern the various departments of the institution. A tentative division of the Museum under the following groups is proposed:

Art: Painting and Sculpture.

Crafts: Ceramics and Tapestries.

Natural History: Ornithology, Entomology, Zoology, Botany, Conchology.

Stamford History.

Stamford Geology.

Indian Relics.

The Art Department will be in charge of a member of recognized ability. Classes in printing, drawing and modeling will be formed, and, while at first not many original paintings or statues may be available, yet excellent copies of famous paint-

ings and plaster casts of celebrated statuary are obtainable at a reasonable cost. These will serve all working purposes. The lack of such a collection has more than once been lamented by art lovers.

The Department of Natural History must of necessity play an important role in the life of the Museum. The study of birds is a never ending source of pleasure. Already a fairly complete collection of mounted specimens of resident birds is at hand, the beauty and variety of which are both surprising and pleasing. A well-organized Bird Club with the Museum as headquarters could work wonders for bird protection and in the dissemination of love for our feathered beauties.

In entomology we have a powerful lever for good. Butterflies, moths, beetles interest almost every boy. Let us form field classes, show the boys where and how the caterpillar lives, how it metamorphoses and finally emerges from chrysalis and cocoon. Show the boy that any old log may be a perfect mine of surprises, and that under a piece of bark a treasure is often found. Show him how to prepare, preserve and mount his specimen and there will be no flagging of interest. Furthermore, the lessons in the propagation of life may thus be taught in such a manner that the subject is at once removed from the domain of the morbid and the mysterious, and becomes a natural phenomenon.

Botany will appeal especially to the girls. Field classes will again be the instrument of study and pleasure. Flowers and ferns, leaves and grasses will be collected, dried and preserved. Drawings made of the different stages of plant development could be framed and kept for future comparison. A multitude of interesting things will be found afield to add a continuous zest to the work.

Zoology will find its devotees, for there are many creatures whose lairs may be visited, and whose habits and actions may be watched and studied. Many beautiful shells are found on our own shores. For the student of conchology there is an abundance of material. The Aquarium Club will adequately meet the needs of those interested in fishes.

Boys and girls not interested in any of these subjects may find their pleasure in geology and mineralogy. Here again field and laboratory classes will supply

the incentive to get in touch with the "Great Outdoors." The many ways in which such an institution can make an indelible impression on the lives of our rising generation will readily present themselves to all who read these lines.

A trained curator is to be in charge of the Museum. Without trained supervision chaos would soon reign. The plan is endorsed by the Stamford Medical Association, by Dr. William J. Long, Dr. Robert T. Morris and Dr. William T. Hornaday, Curator of the Bronx Zoological Park. Already a goodly membership has been secured. But much remains to be done. Every one is earnestly urged to become a member of the Stamford Museum Society, so that we may soon give to our city an institution to which we may point with pride as the result of our own efforts.

The Only Known Albino Frog.

The "N. Y. Zoological Society Bulletin" reports an albino frog captured by Henry Snyder, the son of the Head Keeper of Reptiles, at Scarsdale, Westchester County, New York, and by him presented to the Zoological Park. The "Bulletin" states: "When this specimen first was seen with some normally colored green frogs, it was thought to be a diseased specimen, but the young collector wisely considered it worth while to take home the specimen and show it to his father. Mr. Snyder immediately realized the rarity and importance of the find. Out of the thousands of frogs that during the past fifteen years have been caught for our reptile collection, no one who has caught and otherwise handled many thousands of frogs for quite a number of years, ever previously has secured an albino specimen. The writer has recently examined all available records, and has failed to find any mention of an albino frog having been caught in the United States. Europe can show records of several species of frogs and toads in which albinism occurs from time to time, but this is the first specimen recorded for America.

"The specimen referred to is a common pond frog, (*Rana clamitans*) such as may be found in almost any brook, ditch, pool or freshwater swamp. Its color is a waxy yellowish white on all upper surface, and milky-white under-

neath; the eyes are brilliant red, with a narrow gold rim around the pupil. Our specimen is a female about two and three quarter inches in length of head and body, and therefore not quite adult. At first it was very timid, darting around its cage with nervous agility, bruising its head against the screen



ALBINO FROG.

Photographed with common color phase to show the marked difference.

Cut by courtesy of the "Zoological Society.

top and glass sides whenever anyone came near it. After nearly three months of captivity, however, it has lost its nervous fear, and will come from its hiding place under the moss provided for it and hunt the roaches, mealworms and earthworms which form its food. It will also sit for hours on a large flat stone in the center of its cage, apparently quite content with its surroundings.

"Of course this frog is enjoying special care, and we look forward to keeping it for a reasonably long time."

Will our members and other friends keep on the watch for albino frogs? We would be glad this coming spring to have a report of the total number and the different varieties seen in one place?

The Royal Scottish Arboricultural Society began some thirty-four years ago to plant with Douglas fir certain barren northern slopes between sea-level and twelve hundred feet elevation. Some of the earlier plantations have now been cut, and show a net profit of nearly seventy pounds to the acre, on land that had been considered virtually worthless.

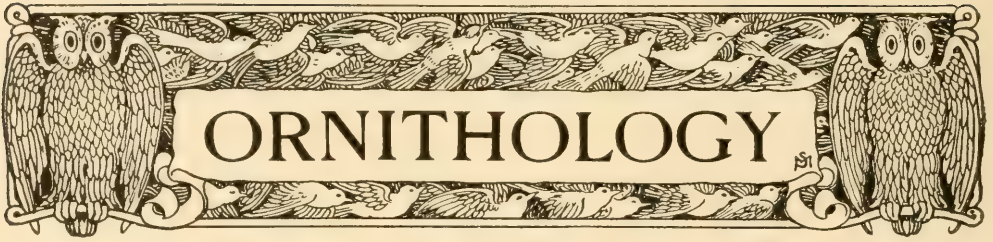
An Astonishing Form of Snake.

BY CLARENCE A. POPE, ENGLISH, INDIANA.

Back through the ages of time and the growth of man legends and myths have been sung and told by the bards, poets and prose writers, almost all of which have embodied in them, it seems, some degree of superstition. All antiquity seems to have been darkened by overshadowing deeds of horror; the people cowered in fear by the threatening approach of ferocious animals and venomous dragons, and, in fact, if the legends be true, man's existence depended upon his continuous struggle and final defeat of the serpent family. It is highly probable that man's superstition and fear for the hydra, dragon, and great serpents that infested the interminable forests and swamps was well founded upon some reality; upon some actual experience in life. We can hardly believe that the myths, as we know them, would have pictured man's struggle with these multiheaded dragons and monsters unless at some time there was a real basic foundation of similar facts that stimulated the mind to portray such vivid pictures of life, horror and death.

This idea was more vividly impressed upon his mind when the following truth came under the writer's observation:

A group of men lounging around the little country store of Pilot Knob, Indiana were talking in a matter-of-fact way about a two-headed snake that had recently been killed and invited the writer to accompany them to view the newly discovered freak. Back of an old blacksmith shop, where the weeds had been permitted to grow to an unusual height, was the object sought. The snake was three feet eight inches long, was of a black and white splotched effect, resembling a cow-snake in many respects. The belly was of two colors—one end white, the other a mottled blue. There was a full sized, perfectly developed head on either end of the body. However the two heads were not of the same type—one was that of a non-poisonous snake but the other bore every resemblance of the rattlesnake family—shape, fangs, jaws and eyes. In fact nature had so well performed her duty in the creation of this freak that those who discovered it coiled thought there were two snakes, and not until after it was killed did they learn the real truth. This snake was killed September 15, 1914, and was the second of its kind to be killed near this vicinity.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor

The Return of the Birds.

When the pussy-willows are bursting from their winter shells and creeping softly out along the streams; when the growing alder catkins are keeping pace with the lengthening days, and the March sun smiling upon the brown meadows seems to draw forth the tiny shoots of green; when the spiral leaves of the unfolding skunks' cabbage dot the marsh, and the blossoming swamp maples cast a rosy tint over the hillsides: then it is

that we eagerly look for the coming of the spring birds.

It may be the cheery call of a phoebe along the river; a song sparrow mounting a low shrub in the meadow and pouring out its liquid melody, or the soft, plaintive call of a bluebird as it drops down from the sky and settles upon the old apple tree;—any one of these it may be which first brings to our minds the fact that spring is here; that a great and wonderful change is going on in every tree and shrub and plant, and that every living thing is awakening to the touch of that power which stirs its innermost being.

The great mass of our songsters will not arrive before late April or May, when the weather becomes settled and insect



"WHEN THE PUSSY-WILLOWS ARE BURSTING FROM THEIR WINTER SHELLS."



THE BLUEBIRD CARRIES THE SKY ABOVE
AND THE EARTH BENEATH.

and plant life furnish adequate food and shelter; and while these will be eagerly sought and welcomed back to their favorite haunts, it is somehow the *first call* that gives us the thrill. It is that call for which we have waited many weeks, and perhaps in search of which we have wandered for days over the hills or along the streams, and thrice welcome seems the swift-winged messenger who brings it.

In any great movement we must admire the pioneers. It is those who forge ahead, establishing themselves under uncertain conditions and maintaining their living against adverse circumstances, who pave the way and smooth the road for those who follow. So it is with the returning birds: we love the vanguard of the advancing host. The phoebe that calls from his perch over the ice-margined river; the song sparrow that sings through the blustering March wind, and the flicker drumming merrily in the cold, gray dawn of an early spring morning:—these awake our enthusiasm and excite our admiration.

There are some fifty species of birds which an interested observer should be able to record from Massachusetts during the month of March. Nearly half of these are classed as winter visitants or permanent residents, the remainder constituting the early spring migrants. The wild geese are honking their way across the sky in great wedge-shaped flocks; the red-tailed hawk is wheeling and soaring above the woods and meadows,—the very spirit of exultation; robins are again appearing about our homes; flickers are drumming their loud tattoo on the dead stubs, and before the month is out the meadows will be ringing with the lusty calls of the red-winged blackbirds. The bronze grackles returning to the neighbor-



"WE MAY FIND THEM 'EXCAVATING CAVE-
TIES' IN THE DEAD STUBS."

ing pines awaken us some morning with their harsh, squeaky notes,—yet even these sound now like music to our ears.

Many of the birds which have been with us through the winter are showing new activities. The juncos seem to be gathering in larger flocks, and, in company with the migrating fox sparrows preparatory to making their way northward, now make the thickets and hillsides ring with their sweet music. Crows are becoming numerous and seem to caw excitedly: though many of these hardy birds remain with us the year 'round, there seems to be a touch of the migrating instinct still in their breasts, as evinced by the large flocks which suddenly appear in this latitude in late February and early March. The blue jays, which were comparatively silent through the winter, are becoming restless and noisy; the plaintive trill of the little screech owl haunts the dusk, and we may hear the mating calls of the chickadee and downy woodpecker, which come less frequently now to our suet. We may find them instead searching out holes or excavating cavities in the dead stubs, for they begin this work far in advance of the time when they will occupy these for their new homes.

March, then, though it be a blustering month in New England, is, nevertheless, a welcome one to the ornithologist, for it brings us the return of the birds,—at least, of the more hardy ones, with the assurance of others soon to follow.

My Little Owl.

BY J. WILLIAM LLOYD, WESTFIELD, NEW JERSEY.

There is a little screech owl of the gray phase that has been one of the joys of my nights for years and is now a joy in my days also. He is a lovely, fluffy creature, of unusual beauty of plumage, gray and black and white, and when I am sleeping on my porch, I love to wake in the night, or dusk of morning, and see this little ghost-like shadow flit, or hear his weird, flute-like music tremble on the listening ear.

I heard a little owl at eve

With trembling voice proclaim his joy;
He loved the weirdness of the dusk—
And so, O little owl, do I.

I love to watch the first star light,
I love to see the wan moon shine,
And there, against the ivory west,
The blackness of the forest line.

I love the silence and the chill,
The sense of difference from the day;
A spirit in another world
To seem, and go an unknown way.

For a long time this little neighbor had his habitation in a woodpecker's hole in the top of a dead pignut tree, in the fence line, back of my barn. But in a storm the tree was blown down and my owl's



MY LITTLE OWL ON THE SHELF UNDER THE
PEAK OF THE BARN.
Photographed by the author.

pellets were no more found there. Where he went for a while I do not know. In 1914 I made an oblong box for a gray squirrel that was visiting my place, and fastened it to a hickory tree in front of the house. The length of the box was parallel with the tree trunk and at the upper end, in front, was a round hole. The squirrel and his mate accepted it and all was well for a while. But sometime in February I became aware that the little owl whose morning song I had heard all winter, without much regard to weather, had usurped the squirrel box. We saw his face in the doorway one day, and one snowy morning we saw the squirrels dancing on the roof and scolding. I made another and hoped more attractive box for owls and fastened it to the next tree, a sweet birch, thinking to toll Megascops to it.

But he seemed contented with his stolen

property, and willing that the other fellow should do the moving. There was considerable argument and agitation for some time, the result being that the squirrels rejected both boxes and became only morning visitors for nuts.

The owl was a rather irregular occupant of this box till warm weather came, but sometime in the fall he moved to a hole that I made in the peak of the barn. Behind it I placed a deep, narrow box with sawdust and shavings at the bottom, and an opening only at the entrance hole. Outside, just below the hole, was a little shelf. This caught the morning light and held the sun all day till nearly mid-afternoon and could be clearly seen from one of our windows. The owl has lived there ever since, although sometimes absent for a day, or for several consecutive days.

I have learned from this owl something that I did not know, and have never seen in print—that owls do not necessarily dislike daylight nor even sunshine, provided their eyes are not much exposed. I had thought that an owl always hides himself in darkness or in deep shadow, and remains silent and still in the daytime, although I had heard a great horned owl utter his hoarse hoot, like the bark of a big dog, in mid-afternoon, in the cypress swamps of Florida.

In my journal for March 26, 1914, I have this note concerning my little owl: "One evening, before sunset, his head stuck out of the hole of a squirrel house on my hickory tree, facing the sun which shone brightly on his face, the eyes being apparently closed. Hearing me, he drew his head slowly in, one eye opening so it shone glassy in the sun which was right on it. Yesterday he sat in the little pigeon window hole of the pump house for hours, nearly all the afternoon in fact, facing southeast, and did not go away though I often walked near or just below him. He would shrink a little sometimes, or turn his head to follow me, but often did not visibly move. He looked like a bit of rotten stump set up there in the shadow. Though visible for hours, full length, none of the birds feasting on my suet, about thirty yards in front of him, saw him."

On April 27, 1914: "The little owl got into the west window of the barn to-day and hooted his bubbling note at 2:30 P. M. The sky was dull and overcast, still the sun was almost out. He shrank

into a shapeless stump when I looked at him, but did not attempt to fly. I had never previously heard a screech owl hoot in the daytime at this season of the year."

The last sentence refers to the fact that I once heard a screech owl give a little hoot on a dull day in January.

On January 22, 1915. "The little screech owl has this winter taken up his abode in the box that I put for him behind the hole in the peak of the barn. Sometimes he is absent for a day, or for several days, but always returns. Once or twice the blue jays mobbed him. At first this drove him in, but later he stood his ground in grim contempt and dangerous vigilance and they did not quite dare to close with him. He likes especially to sit outside on a shelf. . . . all day long in the winter sunshine, his eyes apparently closed or opening as narrow slits when disturbed. Through the glass I have distinctly seen the sun glint on the half open eye."

I do not share in the usual dislike of the screech owl's song. On the contrary, I love it. I find it expressive. At times it is fierce or sad, or it may be tender and musical. It is like a flower of the night.

The Hovering Instinct.

BY JOSEPH W. LIPPINCOTT, BETHAYRES, PA.

I once saw a sparrow hawk hover over a grass patch and then dart upon a small garter snake which, instead of being directly beneath him, was fully fifteen yards further up the field. Mice I have seen captured nearly as far ahead and insects at various distances, but sometimes almost straight below the hovering point.

It would seem therefore that the little hawk's eyes instead of concentrating on one spot, thus making a fixed position for hovering more easy, are searching the ground near and far while some strange force keeps his body exactly stationary regardless of ordinary winds. It is much the same with the humming bird and the king fisher; indeed many birds, even the English sparrow, the crested flycatcher and the tree swallow, at times do strange hovering antics which bear out the theory that a wonderful subconscious force must aid in maintaining position. It would be interesting to experiment with time exposure photographs of hovering sparrow hawks facing various wind velocities. The wings, head and tail would blur, but how about the body?

The Red-shouldered Hawk.

BY EDWIN L. JACK, PORTLAND, ME.

High up in the sea of blue, where a few fleecy clouds were sailing, perhaps you have seen a large hawk wheeling in spirals and frequently sending forth its sharp cry "ker-ker-ker." The "red-

usually some rough material such as fine twigs and sometimes pieces of bark are used. On this rough foundation from three to four dirty-white eggs smooched with brown are laid.

Young hawks are very interesting little fellows. They remain in the downy



A YOUNG RED-SHOULDERED HAWK THREE WEEKS OLD.

Photographed by the author.

shoulder," like many others of the hawk family, secures a large amount of its food by flying high in the air and watching the earth far below with its sharp eyes for whatever prey happens to be moving the tall grass tops in the meadows, thus betraying its location and quite frequently furnishing the bird with a meal. All hawks are generally thought of as chicken thieves, but it is only when driven by hunger that the "red-shoulder" ever approaches the barnyard. In the main this bird's food consists of field mice, frogs and snakes.

The red-shouldered hawk is a large bird, measuring twenty to twenty-four inches in length: its color is brown and grayish, the shoulders having a pronounced reddish-brown cast from which the bird derives its name.

This hawk places its nest in the top-most branches of tall trees, usually in the woods. The nest is a rather rough structure, of small branches apparently very loosely woven together, the lining is

stage for three or four weeks and it is not until they are at least two weeks old that the first pin feathers appear,—soon bursting forth into blackish brown feathers. They remain in the nest about six or seven weeks and when ready to leave are possessed with remarkably strong wings. This no doubt accounts for the fact that young hawks are rarely found on the ground unable to fly as are so many other young birds.

Our California navel orange originated in 1822, in Brazil, as a bud sport from the ordinary seeded variety introduced from Portugal. Trees first reached this country in 1868, but in a dying condition so that only some of the buds remained alive. These were promptly grafted on to seedlings at the Government greenhouses in Washington. Two of these grafted trees were sent to Riverside, California, in 1873. Now there are a hundred thousand acres of them in the region, and each year their fruit fills twenty-five thousand cars.

The Commercial Value of Birds.

We sometimes think that the whole argument of bird protection is based on sentiment, although demonstrations have not been lacking to show that insect-eating birds have frequently saved dollars for the farmer in saving crops that have been attacked by destructive pests, which, but for the birds' help would have been a total loss or partial loss.

We also find the worth of our bird friends proven in their relations with our trees. That shade trees add materially to the value of residential property is now generally acknowledged:—a price ranging from \$100.00 to \$1,000.00 having been definitely set upon individual trees in several recent court cases;—and it cannot be denied that birds render us great service in the preservation of such trees.

In the State of Maine, the actual income from its migratory water-fowl is computed to be \$650,000.00 every year, while Oregon places its water-fowl valuation at a million dollars annually.

The Federal Migratory Bird Law, known otherwise as "The Weeks-McLean Bill," has now been in operation about two years, during which period a marked increase in the water-fowl throughout the United States has taken place; which, for the greater part, seems to be indisputably a result of the passage of this bill. Other beneficial results from this law are apparent among the shore birds, and while in the main it has been well received and at least forty states have passed regulations supplementing its work, there are still those short-sighted or selfish enough to oppose it, and several attempts have been made to declare the law unconstitutional, or to appeal from its justice. This law required a tremendous amount of hard work to secure its passage, and any attempt to overthrow or nullify its effects by counter legislation should be vigorously fought by every true sportsman, bird-lover and conservationist in the country.

As a migratory bird cannot properly belong to any one state or locality, and as these usually congregate in such numbers and under such conditions at certain seasons that their ranks are often largely depleted by unthinking people owing to lax local regulations,

the wisdom of federal control of all migratory birds is self-apparent. In some instances, of course, this will necessitate the changing of local legislation to meet new requirements, and may at first seem like depriving some of their individual rights in shooting; but it appears to have been conclusively shown that birds have an actual commercial, as well as an aesthetic, value; that their usefulness and ownership are confined to no one season or locality, and therefore, no one state should have the right to enact laws governing them which would in any way infringe upon the rights of the people at large—the people who are the real owners of the birds.

Notes from Bartville, Pa.

Mrs. D. W. Jackson, of Bartville, Pa., writes of the abundance of goldfinches, purple finches, tree sparrows and juncos about her home during the past winter; also the wintering of a pair of cardinals; and, on the 24th and 26th of January, the visitation of a pair of bluebirds, in addition to the usual chickadees and nuthatches, to partake of the abundant supply of food which is always at the disposal of her bird friends. She mentions also an instance of a crow being frozen to the ice as it was taking a drink, being reported to her by a writer from Chester County.

The following extract from a letter to her while away shows the interest of a young maid at home in the feeding of the birds: "It is about nine-thirty and the little birds are all around getting their morning meal. I see the little juncos and tree sparrows eating the seeds which I put out upon the point and hillside. Nuthatch in locust tree: also saw the cardinal early this morning. The English sparrows come up here in flocks after the feed which I scatter around for the other birds. The little dog chases them away when she gets a chance.—There was a little chickadee.—I don't know what was wrong with it. It settled upon the little peach tree, and I watched it to see what it would do, and it just hung on a branch about ten minutes, upside down just like a little bat, until I thought it was dead, so I went out to examine it, and it stuck to the branch until I picked it into my hands. It seemed rather surprised when it saw someone had it fast. I took him into the house to warm him and give him

some crumbs, and I put him under the rice sieve, and he ate the crumbs and drank some water. After a while it began to want to get out. He would climb up on the sieve just like he does on a tree and hang head downward, so I thought I had better let him go. I took him out and sure enough he was not slow about flying away. He seemed so very miniature that I could hardly think he was a chickadee when I had him in my hands.

The other day a hawk sat on the wire and I thought it was a robin at first, but when it flew away I could see the difference. It had a red tail, was not much larger than a robin. Now and then I see a little goldfinch flying over."

We are glad to note this interest in the birds by a young girl. It was a kindly deed to care for the chickadee, and also shows good observation to note the difference between a robin and the similar-sized bird, which was doubtless a sparrowhawk.—H. G. H.

Peculiar Nest of the Tit-Warbler.

H. STUART DOVE, M. R. A. O. U., WEST DEVONPORT, TASMANIA, AUSTRALIA.
(MEMBER TASMANIA FIELD NAT. CLUB.)

To complete the paper on the yellow-tailed tit-warbler sent last month, I should like to describe an extraordinary nest of this little bird which I found in a white gum on the bank of the Don River, North-west Tasmania.

This nest was hung amid the pendulous branchlets of the tree in a similar fashion to that recently described, but whereas the nest built in the tree close to my cottage measured $6 \times 4\frac{1}{2}$ inches; that found at the Don River was a long purse-like structure no less than ten inches in length—a great size, when compared with the diminutive builder. It was constructed of greenish grass, part of which was woven around the twigs to hold it securely; the lining being a copious one of wool and feathers. In the lower part of this purse-like structure was the entrance to the incubation chamber, the aperture being just about large enough to admit one's forefinger. Above this was the opening to a second chamber,—not lined, and again, above this, a third compartment, also unlined; while to crown all was the open cavity, or so-called "cock's nest" on the summit.

Only the lowest, or lined, chamber

had been used, and why the others were formed is a mystery. It is not rare for the nest of this species to contain one un-lined compartment, but this is the only example I have discovered with two besides the "nesting-box."

Dr. Sharpe, in describing the nest of the South African Penduline Tit, says "towards the upper end of the nest is a funnel-shaped opening, and below this is a distinct little pocket, the use of which is not clearly understood. It is supposed to be the roosting place of the male, for whom, as the nestlings grow, there would be little room in the chamber itself. The little birds are said to draw in the tubular entrance of the nest before they finally go to sleep, and they then fasten it up tightly, so that any enemy, snake or otherwise, on attacking the nest, fumbles about at the pocket, or false entrance while the little birds peck a hole in the back part and escape."

Some naturalists consider that the false chamber in the structure of our "Acanthiza" is meant to delude the Bronze Cuckoo, which often victimizes this species, but the cuckoo's egg is so seldom found in the "wrong box" that I cannot hold to this theory. It seems far more likely that these extra compartments are intended to serve as 'over-flow rooms' for some of the brood to sleep in when they are getting feathered, and the incubation room is too stuffy for the whole lot.

It would be interesting if any of your readers who have observed anything of the kind would send notes to THE GUIDE TO NATURE upon the subject, thus possibly shedding light upon this curious habit of our bird.

A Delight to See and a Joy to Use.

The C. P. Goerz American Optical Company have recently issued several attractive booklets containing illustrations of their cameras and of some of the remarkable results achieved with them. Those that love the outdoor world desire to keep a record of its fleeting scenes. These cameras make that record and do it to perfection. When asking for these booklets will our readers kindly refer to THE GUIDE TO NATURE? Especial attention will then be given to the request.

An Experience with Wilson's Snipe.

BY EDWARD F. BIGELOW.

A Wilson's snipe seriously injured, supposably by a cat, was found in the marshes not far from ARCADIA. The bird's life was saved by driving away the cat, but whether or not the bird had been

lover of fresh-water marshes, where it may be sometimes surprised along the bank of a sluggish stream, with its long flexible bill buried to its base in the soft mud, as it 'bores' for insects.

"The Wilson's snipe has always been a favorite bird with the sportsman, not



THIS BIRD'S INJURY WAS SHOWN IN ITS REMARKABLE TAMENESS.

previously injured is not known. It seemed to be in full possession of all of its physical ability, and was apparently not lamed either in wing or leg. It was remarkably tame. It was easily held in the hand, and showed the slightest wildness. It died soon after its rescue.

Mr. Harry G. Higbee writes of the bird as follows:

"This bird, belonging to the family Scolopacidae, which includes the curlews, yellowlegs, woodcock and sandpipers, is not an uncommon migrant along our eastern coast in both spring and fall, being present in this locality usually in April and early May, in the fall from September to November. It nests principally north of the United States and winters southward to Brazil, though it casually extends its breeding range southward to our middle states and its winter range as far north as New England. Being a bird of solitary habits, it is a

only on account of its esteemed delicacy as food, but also for the exciting sport which it gives the hunter. These birds, known also as 'Jack Snipe,' lie close, and with their excellent protective coloring often entirely escape observation on the brown meadows of the early fall. When they do take wing, it is so suddenly, and followed by so zigzag and erratic a flight that a good marksman is needed to stop one. This sudden spring into the air is usually accompanied by a series of hoarse and somewhat startling cries that add to the excitement and exhilaration of the pursuit. A low drumming or bleating note caused by the rushing of the air through the wings, as the bird descends rapidly from a considerable height, is said to be produced principally in the mating season. A peculiar vocal note has also been credited to the bird at this time. I have never personally heard either of these sounds.

"Widespread reports in a recent investigation by the Massachusetts State Ornithologist indicate that the snipe in the past forty years has decreased by more than fifty per cent throughout most of its former ranges. Records of its breeding in Massachusetts and the neighboring states are now rare, though formerly not uncommon in many localities. Its four eggs, pointed and mottled gray, are placed in a depression in the ground near the border of a pond or a stream."

A Nest of the Wild Dove.

BY DR. R. MENDER, SAN ANTONIO, TEXAS.

Prairie birds of various types usually build their nests on a definite and typical plan. Occasionally, however, influenced



A SNUGLY LOCATED NEST OF THE TEXAS WILD DOVE.

by environment and other circumstances, they alter their methods, but still if possible use the ordinary building material.

The Texas wild dove occasionally erects its fragile nest in an extraordinary way. It sometimes uses the abandoned nest of another bird, occasionally selecting in the West Texas prairie plains, in brushy regions, the old abandoned nest of a mocking bird; or it builds directly on the ground: or, as seen in the accompanying photograph, on or inside of the spinous leaves of the *Opuntia* cactus.

The illustration, taken on the plains by the writer, shows a wild dove's nest with its typical two white eggs, snugly located, perfectly secluded and protected in a quadrangular space of the blooming cactus leaves. The season was the end of July, the main breeding time of our wild dove. The surrounding mesquite trees harbored scores of the breeding birds and their nests. This one was built directly on a dry cactus leaf, surrounded by numbers of others in full bloom, some of golden yellow, and others, in the rear, intensely red, and alive with insects that were feeding on them.

As a rule the Texas wild dove builds on a branch of the mesquite tree, generally using a few dry grass helms. The main breeding season is from the middle of May to October. Some are sparingly found in October and November. In the fields and pastures at sunset, the birds gather in large numbers to fly to their favorite roosting places among the mesquites and the oaks. They are somewhat smaller than the beautiful, white-winged, Mexican, migratory pigeons, which are not protected by the game laws, as they are exceedingly greedy and injure the grain fields considerably more than the common wild dove, which the Texas game law protects from March to September.

Migration Notes of 1915.

BY ANNE E. PERKINS, M. D., COLLINS, N. Y.

One of the most delightful occurrences in the bird life of this vicinity the past season was the appearance, on April 18th, of a pair of cardinal grosbeaks in a swampy tangle on the Cattaraugus Indian Reservation. These birds were repeatedly seen and heard by several of the Audubon Society members, and were there as late as the middle of October. It is believed that they nested, as they were always in the same vicinity and acted very suspicious of observers. I had seen a female not far from this place two years before, and others have reported the male cardinal near Gowanda, two miles away, but it has never been proven that it nested in this vicinity.

On April 4th a flock of two hundred cedar waxwings were seen in a large tulip tree, and all faced the same way. They gathered every afternoon at 5:15 and remained there in the same tree for a half-hour, then retired to the swamp.



"A LITTLE PATIENCE WILL TAME THE
WINTER BIRDS."

Photographed by A. E. Collins, Chapman, New York.

I was able to show this flock to several, as they were prompt to a minute in coming.

On April 20th a female ruffed grouse was found on the porch of the hospital. Part of her tail was missing,—she evidently having been caught and had escaped from some animal. Taken to the woods, she proved able to fly briskly.

The yellow-bellied sapsuckers were never so abundant. Thirty appeared in one grove at the same time and mercilessly attacked the trees, so that the sap was running freely from maples, hemlocks, tulip trees, etc.

A Lincoln's sparrow came on May 13th and remained until May 31st, singing freely, always within a few rods of the same place. Its song is

very noticeable and somewhat remarkable

A pair of rough-winged swallows nested by the creek, in the bank. Tennessee warblers were numerous during migration. The solitary vireo—rare here, even in migration—was observed in a remote glen building a nest. A pair of yellow-billed cuckoos, rarely seen here, were noted day after day in the same spot. This fall pippits appeared on two successive days, in a field. Robins and bluebirds were remarkably numerous all through the season, and on May 30th a nest of slate-colored juncos containing young was found six miles from here.

On November 18th a white-throated sparrow was still here, and on Nov. 28th, two meadowlarks. There wintered a flicker, song sparrow, marsh hawk, red-shouldered hawk, screech owl, barred owl, kingfisher and cowbird, besides the usual winter birds.

My feeding stations were patronized freely from October first to the middle of June by downys, chickadees, nuthatches and jays, and during the winter by a brown creeper and hairy woodpecker and red-breasted nuthatches. The chickadees ate from my hand freely. The nuthatches show a preference for sun-flower seeds; the chickadees, for suet and "Downy" for a fat marrow-bone. The red squirrels interfere with



A WIDE-AWAKE SCREECH OWL.

Photographed by A. E. Chapman, Collins, New York.

seeds in feeding boxes, and the only way I can keep them from carrying off suet is by making pockets of half-inch mesh chicken wire on the trees. The nuthatches crack the seeds of the sunflower in a crevice of the bark and leave the empty shells there.

A little patience will tame the winter birds, and afford much pleasure and profit in feeding and studying them, with opportunities for photographing them. Any boy can make feeding shelves or boxes and even the rudest device answers. Accustom the birds to your presence while eating and very soon chickadees will come to your hands or head for food, and nuthatches can be persuaded soon, but not "Downy."

The Redstart.

BY EDWIN L. JACK, PORTLAND, MAINE.

The favorite haunt of the redstart is in damp, thickly wooded locations. He is a valuable insect exterminator, and I do not know of any bird that presents a more perfect picture of happiness and contentment as he darts in and out among the foliage searching for food.

As a fine example of bird architecture, the redstart's nest is indeed worthy of study. It is not only neat and attractive in appearance, but is a fine sample of protective coloring.

In my location the redstart most frequently places its nest in small maple and gray birch trees, and at a distance of fifteen to forty feet from the ground. Regardless of this fact, the nest here illustrated was built less than two feet from the ground. By the use of strong plant fibres and great skill the birds secured the nest on the first limb of a little maple tree. It was lined with the finest of grasses and dry pine needles, while the edges and sides were completely covered with silver gray plant fibres, perfectly resembling the color of the surrounding branches.

When I first discovered the nest it was empty, but appeared finished and perfect in every detail. I visited it for three days in succession and came to the conclusion that the birds had deserted it for some reason, for during the time I was about the nest, not once did I catch a glimpse of its owners: but camera work on other nests

in that locality took me to the redstarts' location daily and one morning I found that the nest contained one tiny egg, profusely speckled with brown, and four days later the nest contained the full set of five eggs.

For eleven days I made visits to that nest and watched its contents and on



NEST OF THE REDSTART.

"The edges and sides were completely covered with silver gray plant fibres, perfectly resembling the color of the surrounding branches."

the twelfth day the mother bird brought off a brood of five very tiny youngsters, and their mouths were ever open for food.

During the period the mother bird was brooding the eggs, I had secured several studies of her on the nest, with my camera. By the time the young were out, the parent birds had become so accustomed to me that I could sit within three feet of the nest and secure a perfect focus without their paying the slightest attention to me. I have found that in bird photography, if one works about a nest with care and patience, being careful as to making unnecessary noise and quick movements, birds soon come to know friends from enemies and the results

that may be obtained in such cases are, indeed, remarkable.

Being able to observe these redstarts at so close a range, I discovered that for the first two or three days the youngsters' diet consisted chiefly of mosquitos, and as the location was very damp, the birds had no trouble in securing them.

I watched the process of feeding the young by the hour. The male bird seemed to do the greater part of it as is not generally the custom. He would dart from one small branch to another and frequently I could hear his bill snap as he snatched the insects. Having secured a number the bird would fly to the edge of the nest, when instantly up would come five gaping mouths, but it was generally not more than two that were fed at a time. And so on the birds would repeat the performance throughout the day.

As the young birds grew in size and strength, larger insects were substituted, and in the course of a single day this one pair of redstarts proved their great value as insect exterminators by consuming hundreds of noxious insects.

Derelict Cats.

Few city dwellers realize the evils resulting from the neglect of cats that are for a time kept as pets, then allowed to wander. This is well illustrated from our experience with stray cats within the boundaries of the Zoological Park. It has been necessary to detail one of our men to trap neglected felines that have taken to a life in the woods and subsist largely upon birds, young rabbits and squirrels. It is astounding to note the actual number of cats trapped within the area of the Park in the past three years. Up to the end of November, 1915, we had trapped and otherwise destroyed six hundred and two cats that were living and hunting in the Park. The Botanical Garden reports similar conditions.

When we consider the other large areas of the northern city parks where hordes of cats prowl unmolested, the extent of the depredations of these bird-killing creatures may be estimated. Many of the captured cats are gaunt, savage creatures that through a marauding, half-starved and

desperate condition are a real menace to full-grown rabbits and squirrels; and bird-hunting is their constant delight. Occasionally, also, one of these cats will fight a human enemy. The writer can attest this by an experience when a tramp cat emerging from some foliage deliberately leaped upward and savagely bit his hand. Keeper Romanoff, who so persistently hunts these animals, has several times been attacked by them.

During our cat-hunting work we have come upon a surprising number of other predatory animals in the Park. Our lists for three years show twenty-five wild racoons, twenty-one opossums, and about a dozen weasels. Although in a different class, from the damage they do, we have also checked off fourteen muskrats.—"N. Y. Zoological Society Bulletin."

The Virginia Agricultural Experiment Station, which makes a specialty of apples, is now engaged with the problem of the inheritance of time of blossoming.

Not All That's Best Can Be Bought.

Not all that's best can e'er be bought,
But it can be so aptly sought,
If we would only take the pains,
And ours, at least, would be the gains.

The sunrise is a pageant rare
To most of us, as on we fare:
It only means an early rise,
And thrills us with the glad surprise.

The bird choir in the early morn,
No one who hears could feel forlorn:
The ecstasy would well repay
A woodland walk at dawn of day.

The roadside is a treasure-trove
To those who nature truly love;
And things that would our knowledge foil,
Are found in one square foot of soil.

The trees and flowers, the birds and bees,
What interests can rival these?
A look, a book to interpret them,
And in each one we find a gem.

The stars that spangle all the sky,
We feel them there, yet pass them by:
The only need, an upward look
To rarest page of Nature's book.

The simplest pleasures are the best;
To them is brought an added zest.
Of joys undreamed of at the start,
As knowledge reveals the heart

—Emma Peirce.

TO KNOW THE STARRY HEAVENS

The Heavens in March.

BY PROFESSOR ERIC DOOLITTLE OF THE
UNIVERSITY OF PENNSYLVANIA.

It is with the coming of March, our first spring month, that the slow withdrawal of the bright train of winter constellations begins. Orion, Taurus and Gemini are found on each succeeding night a little lower in the west; the beau-

tiful Dog Stars have been carried well past the meridian, and the golden arch of the Milky Way, which for so many months has passed through the very zenith of the heavens, is now perceptibly sinking westward in our evening sky. The large constellation, Bootes, with



Figure 1. The Constellations at 9 P. M. March 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted.)

tiful Dog Stars have been carried well past the meridian, and the golden arch of the Milky Way, which for so many months has passed through the very zenith of the heavens, is now perceptibly sinking westward in our evening sky.

The large constellation, Bootes, with

horizon almost to the very meridian, has as yet dragged but half of its great length from below the ground, and similarly but one-half of Virgo, the first of the train of summer groups, has so far appeared. Yet the whole eastern heavens are far less conspicuous than they were a few

months ago; the gradual transformation of the winter into the summer skies is already clearly under way.

Meanwhile no less than three of the "Wandering Stars," or planets, still shine brightly in our evening heavens. Jupiter has indeed drawn too near the sun to be observed, but in the west we see the exceedingly brilliant Venus; the beautiful and always interesting Saturn is high in the south, while only a little way to the east of the meridian our attention is at once attracted by the lurid, almost ominous, light of the red planet Mars.

* * * * *

The Planet Mars.

Next to Venus, this beautiful world is now the most conspicuous object in the evening skies. It will be found almost exactly due south in the early evening, very near the border line between the groups Cancer and Leo. This planet is now nearly three times as bright as the golden Saturn near-by and it is six times as bright as the neighboring bluish star, Regulus; the silvery Venus, however, far exceeds it, for this, our Sister World, now shines in the west with fifteen times the brightness of the planet Mars.

The reader who has been watching the interesting motions of our evening planets will remember how very rapidly Mars ran eastward across the constellations until by January 1 it had advanced well into Leo and how since that time it has been moving slowly westward again. This westward—or retrograde—motion will cease and the planet begin again to move eastward on the twenty-second of the present month, but throughout all of March Mars will change its position among the stars but very little.

Even in a small telescope the white Polar Caps, of this planet are very distinctly visible, while if the seeing is good one may detect the Hour Glass Sea, the Lake of the Sun, the Great South Sea and a few other of the larger surface markings. But, nevertheless, except in the largest glasses, this interesting little world is a rather disappointing object. Mars is so small a world, being only 4230 miles in diameter, that even at the best it looks far smaller than the very much larger, though far more distant, Jupiter. And besides this, its markings appear rather as indistinct and difficult shadings in contrast to the conspicuous and sharply cut markings of the larger planet.

Yet there is a special pleasure in a prolonged examination of a difficult object of this kind. If the observer will devote perhaps an hour or more to this task, trying different powers and patiently waiting for moments of unusual seeing, he will gradually detect many more details than he would have supposed possible from a first brief view.

A very little watching will show him that this world is turning around—the

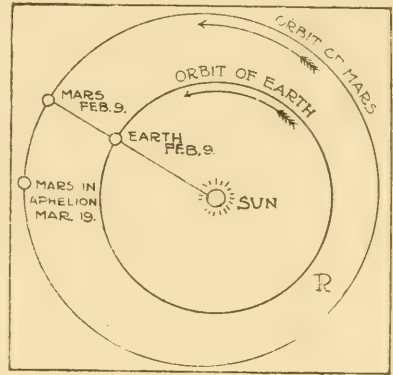


Figure 2. Showing the positions of the Earth, the Sun and Mars when the two planets were this year nearly together. If the Earth passes Mars when the planets are in the region marked R, the approach is evidently a much closer one.

day on Mars being but thirty-seven minutes longer than our own. Spring, summer, autumn and winter also succeed one another on the Red Planet, just as they do with us. In the northern hemisphere of the planet the sun is now as high in the heavens as it is with us in May. Here the summer is at hand, their longest day—or Summer Solstice—occurring (according to our earth-calendar) during the first week of next May. In the southern hemisphere of the planet winter is now advancing. Accordingly the south polar cap is now large and is growing larger, while the cap around the north pole is melting away.

Nearly the whole northern hemisphere of the planet is of a yellow or orange shade, while the so-called seas are of a grayish or greenish color. It is now practically certain that the former are great desert regions; the latter are certainly not water—as was at first thought—for in the largest telescopes they show a great mass of intricate and permanent detail. Many astronomers believe that they are—at least in part—regions of some sort of vegetation, but this is as yet

by no means certain. As to the intricate network of lines or bands of the same color as the "seas" which cover the planet, these interesting but mysterious features are far beyond the power of a smaller telescope.

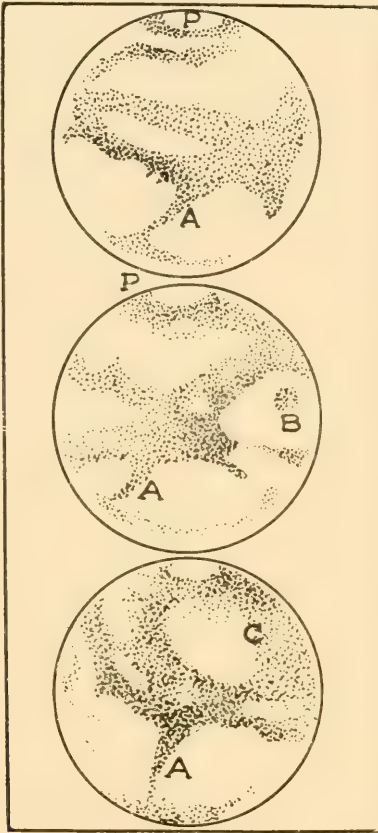


Figure 3. Drawings of the planet Mars. The Syrtis Major, or Hourglass "Sea," at A, the Lake of the Sun, at B, and the South Sea, at C, as well as the Polar Caps, at P, can be seen under good conditions in comparatively small telescopes.

Though Mars passed nearest to the earth on February 9, and although it has moved but a little way along its orbit since then, the present is unfortunately not a very favorable opposition. The reason for this will be evident from an examination of Figure 2. The sun is no less than thirteen millions of miles outside the center of the nearly round orbit, so that if the earth passes Mars when this planet is at the most remote part of its path the two worlds will be twenty-six millions of miles farther apart than when their approach is the most favorable. In this year Mars passes aphelion—or is farthest from the sun—on March 13.

The Zodiacal Light.

As a new moon occurs on March 3, the last days of February and the first week of March will afford the observer excellent moonless nights on which to look for this most interesting object. He should go out of doors as soon after sunset as the western sky has become dark, and having found a station away from all electric and other artificial lights, he should face directly toward the western point of the horizon. He will then see this great, faint pyramid of light, its base resting on the western horizon and its apex probably extending almost to the Pleiades. It will probably be considerably fainter than that bright part of the Milky Way which is above it, though the brightness of the Zodiacal light often varies suddenly and capriciously.

This faint light at which we look is a real, material object, being nothing less than a great flattened cloud of very small density, which surrounds the sun and extends out into space beyond the orbit of the earth. It is probable that its sudden changes of brightness are electrical in character, and they are probably due to great electrical disturbances on the sun. If so they should be especially marked during the present year when sunspots are most numerous.

* * * * *

The Planets in March.

Mercury reaches its greatest distance west of the sun on March 1, and during the first part of the month may be seen in the dawn for about an hour before sunrise. It will not pass to the east of the sun and become an evening star until April 14.

Venus is the most beautiful object now in the evening heavens. The observer will notice that this planet is now moving very rapidly eastward and northward among the stars so that by the end of the month it will set far in the northwest and shine in our evening skies until four hours after sunset. It will attain its greatest distance east of the sun on April 24, and throughout the entire spring it will grow continually more brilliant, not attaining its greatest brightness until May 27. In the telescope Venus now resembles the moon when this is a little more than half full.

Jupiter, which has shone in our evening skies for so many months, is now lost

in the sun's rays and cannot be well observed. It will pass to the west of the sun and become a morning star on April 1.

Saturn remains in the center of the constellation Gemini in excellent position for observation.

On March 20, at 5 hours 47 minutes P. M. (Eastern Standard Time) the center of the sun will cross the equator and at this instant spring will begin. This day and the following night will be of equal lengths.

The occurrence of Easter during the present year is very late because it happens that a full moon falls on March 19, only one day before the Vernal Equinox. The date of Easter is fixed as that of the first Sunday after the first full moon which follows the Vernal Equinox. The first full moon after March 20 occurs this year on Tuesday, April 18. Accordingly it is the following Sunday, April 23, which is celebrated as Easter Sunday.

A Sun Fades Away.

BY EDWARD F. BIGELOW.

Long before you were born, unless you are more than sixty-three years old, an event took place, an event that on Thursday, March 16th, evening at ten minutes past nine (Eastern Standard Time) will have its effect upon the earth. Some sixty-three years ago, although nobody can tell exactly when, there was shining in its full brightness in distant space a sun fifty-one times brighter than our sun and almost one and a half times the diameter of ours; it was one and one-quarter million miles in diameter. Travelling around this sun was another not so bright. This was 840,000 miles in diameter but probably about six times brighter than our sun. If we should use a little human fancy, we might say that this darker sun was envious of the brighter sun, but the darker, being not so large as the brighter, and being located about three and one-half million miles from the brighter, had to content itself with merely dimming the light until there was not much left to pass into space, and for a time it intercepted some of the light that was streaming into infinity.

If you were on the roof, with a hose that had a stopcock at the nozzle, and you turned off the water, and immediately turned it on again, a vacant space would appear between the nozzle and the end of the falling stream of water, and

an appreciable period of time would elapse before the cut off stream could reach the ground, and that empty space would remain empty until you again turned on the water.

Light travels faster than that stream. While you wink, a ray of light might travel seven times around the earth. For ages that dimmed light stream has at regular intervals been coming toward us at the rate of 175,000 miles a second. We are not able to realize such rapidity, but day and night, year after year, from the time when you were a baby in arms, when you were going to school, when you started in business, while you were experiencing the vicissitudes common to us all, that faint light has been streaming toward us, continuously, persistently, regularly, and it will reach us at ten minutes past nine o'clock on Thursday evening, March 16th. You can then go out and see what happened decades ago in that inconceivably distant space. No astronomer can tell you exactly when it happened. He can only say probably about sixty-two and one-half years ago. He can tell you to the minute when that dim section of the light "stream" will reach this earth. It will be at ten minutes past nine on the evening of March 16th. From that time on, for a little over an hour, the light will steadily increase as the result of that darker sun going by the brighter sun decades ago.

Every reader will recognize in this an astonishing event, an amazing connection of the present with the remote past, but there is still another fact even more astonishing: only a comparatively few will see this marvelous occurrence. It is in none the less wonderful because this dimming of the light stream becomes apparent on the earth so regularly that those who are fond of observing it have discovered that its period is two days, twenty hours, forty-eight minutes and fifty-five and four-tenths seconds. But a difficulty that enters is the fact that we cannot observe it at all times, because the dimming often occurs by day or when our side of the earth is turned away from the star. But do not miss this opportunity to see this remargable event. If you will look in the northwestern sky toward that beautiful cluster that resembles a big fishhook, that the old observers call by the more dignified title of "King Perseus," then a little to the north you will see this huge sun. You may fix your eye

upon all the stars in that immediate vicinity, and you will have no trouble to see the one that winks his eye at you. It has been thus winking regularly through the ages and will continue to do so. That darker sun will continue to revolve around its bright companion in an apparent effort to extinguish its rays. It succeeds temporarily. We see the event only when the darker sun passes between us and the bright one. If you care to know more about this, look up Algol in any book of stars.

A Reminder of the Southern Cross.
Washta, Iowa.

To the Editor:

Just after Sirius crosses the meridian in the latter part of February and

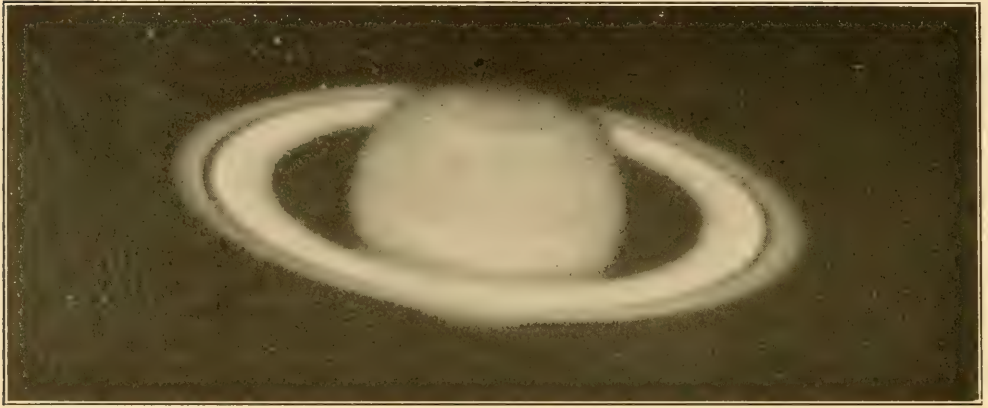
lation are much brighter, three being of the second magnitude. Neither of these crosses has a central star as in the Northern Cross in Cygnus.

I lived for twenty years thirteen degrees north of the equator (Barbados, British West Indies) where I could see the Southern Cross, about thirty degrees above the horizon. And away up here in the frigid northwest, at this time of the year, I always hail the cross that I have described as it brings up strong memories of my island home in the tropics.

FRED S. CARRINGTON.

* * * * *

This statement of Mr. Carrington is entirely correct throughout. As the says, this cross is somewhat too much



SATURN, THAT BEAUTIFUL RINGED PLANET.

A remarkable photograph by Mr. Barnard at the Mt. Wilson Observatory. Sent by the Yerkes Observatory.

March, a little to the south and east of that star is a cross formed by three stars of Canis Major: Delta at the top of the cross is a third magnitude star; Epsilon, forming the right hand arm, a second magnitude; and Eta to the left, a third magnitude. The star forming the foot of the cross is Pi of the constellation Puppis, a third magnitude star and a naked eye double. On a clear evening these four stars, about fifteen and twenty degrees above the horizon, form a very conspicuous cross. They have always attracted my attention, reminding me very much of the Southern Cross, the four stars being almost in a similar position. The Southern Cross is not quite as long, and of course the stars in that constel-

elongated, and it also wants a central star midway between Epsilon and Eta. Our Northern Cross has such a star and is in fact, a very much better proportioned cross than the Southern Cross. This region of Canis Major is rich in beautiful star clusters and star streams. The most beautiful and striking cluster is almost in a straight line between Sirius and Epsilon, one-third of the way down from the Dog Star. It has a red star near its center and its structure is most complex and interesting, even in a small telescope.—Ed.

Only give the time to Nature,
That you spend on lesser things;
Like a miracle will seem
The satisfaction that it brings.
—Emma Peirce.

The Interest in Astronomy.

BY S. C. HUNTER, NEW ROCHELLE,
NEW YORK.

In a recent issue of "The Monthly Evening Sky Map," Mr. Leon Barritt asks, "What is the matter with astronomy?" Astronomy is not taught in grammar schools nor in high schools, and in colleges and universities it is elective. He thinks that the general indifference is owing to the manner in which the subject is presented, and to the parents' desire to have their children follow courses that have a more commercial value.

Whatever the reason may be, there is no doubt about the general absence of the most elementary knowledge on this subject, not with the college graduate only but with the man on the street. When we consider that no other science combines the spectacular and the infinite in such marvelous varieties, the problem of this almost universal apathy becomes difficult to understand. There is, however, a fact that should not be overlooked, one that I feel accounts in some degree for this indifference. This is our modern manner of living. It should not be forgotten that knowledge of the heavenly bodies came originally from a pastoral people. It is of the Arabians, whose clear skies and desert life made them familiar with the stars, that it is written, "He whose roof is heaven, who has no other cover, over whom the stars continually rise and set in one and the same course makes the beginning of his affairs and his knowledge of time depend upon them."

We are an urban people. The glare of the street lights and the marvelous electrical advertisements that flash into our faces from the street corners and the housetops deprive the rank and file of the possibility of searching the heavens for those other lights that are either entirely blotted out or are reduced to an insignificant blur.

For those of us who are lucky enough to live in the country it is left to enter into the appreciation of star gazing. It is a privilege to be in a location that may be thus utilized. Even a little knowledge is a wonderful thing, even only a bowing acquaintance with trees, flowers, rocks. What a zest it gives to the act of living! We observe this and that as we walk through the fields, and we understand, possibly not in whole, but at least in part. So it is with the stars. A complete knowledge is not necessary. Think how impos-

sible that would be. We are actually in touch visually with the infinite. New methods, new devices are daily bringing new discoveries to view and probing deeper and deeper into the vast recesses of space. The more we know, the more appalling is our ignorance, yet we may quietly enjoy the wonderful panoramic



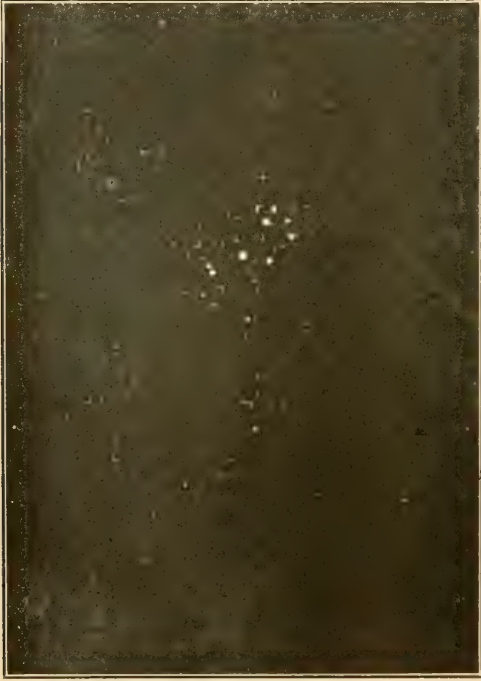
MR. HUNTER'S OBSERVATORY AT NEW
ROCHELLE, NEW YORK.

display that rolls above our heads on any clear night, and now and then nod to a friendly, twinkling eye about which we do know something, just enough to make thrilling this acquaintanceship in the upper vastness.

Except for the technical knowledge, which is of course necessary, books should play a minor part in our star work. It is with a small telescope that the beauties of the starry heavens may be revealed. Reading about the delights of travel is an excellent thing provided we cannot travel. To use a telescope is really to travel. We literally see the wonderful sights and actually experience all the thrills. It is difficult to describe the peculiar sensation of sitting at the eyepiece of a telescope in the quiet of a cloudless night to watch the moving shadow of one of Jupiter's satellites slowly trailing across the colored cloud belts, or great Saturn's shadow edge thrown against the white surface of the encircling rings. Although these enormous bodies are swinging in their orbits with incredible speed, and an hundred million miles away, one is impressed by the feeling that one is suspended in space from some invisible vantage point to watch their noise-

less passage. The use of a telescope produces the sensation of being projected into space in the guise of a softly flitting spirit. It is the nearest approach imaginable to what we might expect would be the sensation of the spirit after its release from its mortal habitat.

I have found that definite work is a great stimulus to one's interest in the



Canst thou bind the sweet influences of Pleiades? - Job xxxviii, 31.

stars. There are many notable objects to be investigated. These are all classified and many different fields are available for study. My interest at present is among the variable stars. I have a little stellar family which varies in magnitude from month to month. These stars I must examine critically each month to determine by certain comparisons whether they have become less or more brilliant, and to report any change in their magnitude. The work becomes a sort of adventure. The field must be located and the star found. Sometimes a star that was bright when last observed is not visible, having apparently totally disappeared. At another time where no star was visible at the last observation, will appear a beautiful speck of red or orange light.

It is unfortunate that the best time for observing the heavens is during December, January and early February—co-

incident with the coldest nights of the year. At nine degrees above zero I have stood in my observatory for two hours in the course of my regular monthly work, but even cold feet and numb fingers can scarcely abate the enthusiasm, when the stars seem almost to speak in their scintillating brilliancy.

I have mentioned as one of the striking convictions of astronomy the element of infinity. The Psalmist has said, "A thousand years in thy sight are but as yesterday when it is past." A look into the heavens conveys a similar idea in regard to the Creator's indifference to space. We cannot conceive of anything that is not in some way limited, yet just above our heads, on any clear night, there is a view that is absolutely free from any limitations of which the human mind has ken. No telescope, in combination with that other marvelous aid, the camera, has yet probed this evidence of the infinite, and as we contemplate man's constantly changing theories of the significance of the various stellar phenomena, we are forced to conclude in devout admiration that surely, "The heavens declare the glory of God; and the firmament showeth his handywork."

* * * * *

(FROM THE EDITOR).

This question of the lack of popular interest in the subject of astronomy has been discussed by a variety of publications and educators. In explaining its banishment from the schools, it is not enough to say that it is a mental and not a utilitarian science. The schools include many things that are not directly related to life. If one were to venture to cross out everything that is not utilitarian, I fear that the schedule would be left pretty nearly blank. Much arithmetic would be eliminated, with considerable grammar, and such studies as algebra, geometry, foreign history, with some geography, as well as a number of others. But the schools very commendably do not eliminate studies that pertain to strictly mental training. They have, let it be to their credit, not commercialized the whole thing. I am inclined to think that the trouble, especially in the lower grades, is the difficulty of having the child grasp the subject. In the high school, it has been made, as it has been made in college—almost wholly a mathematical pursuit. One feels like deciding that astronomy



THE NEBULA IN PLEIADES SHOWN BY PHOTOGRAPHY.

This photograph and the one on the previous page are from the Yerkes Observatory.

ranks with music as a cultural pleasure for those that can enjoy it. The trouble enters when we notice that comparatively few have the proper mentality for the enjoyment of "the music of the spheres."

In guiding visitors at the new Sound Beach Astronomical Observatory, I am more and more impressed by the fact that the telescope is a disappointment to most

persons. They think that a star will be magnified until it will resemble gorgeous fireworks, and when they are told that even the best and largest glasses show a fixed star as only a fine point of light, they ask, "What is the use of all this equipment then? I can see as well as that without a telescope."

The amateur astronomer regards Jupi-

ter and Saturn and the nebula of Orion as among the most spectacular things in the heavens, but the average visitor is prepared to compare them with the Fourth of July pyrotechnics. Time and again, after gazing at that world thirteen hundred times as large as the earth, with its four conspicuous satellites, or at that wonderful ringed world, the spectator has asked, "Is that all we are going to see?"

Recently, in showing the moon in favorable circumstances, at first quarter, an intelligent lady said in a disappointed tone, "It is quite pretty; looks like a piece of lace!" To think that while she was looking at volcanoes seventy or eighty miles in diameter and at mountain ranges six or seven hundred miles long, she could even think of a "piece of lace!"

A clear headed, efficient business man visited the observatory, and thoroughly enjoyed everything that was shown. He had read considerably in astronomy and

could appreciate the signification of what he saw. I told him that most persons are disappointed, that the majority expect to see the moon as big as an elephant, and Jupiter and its satellites at least as big as a railroad train.

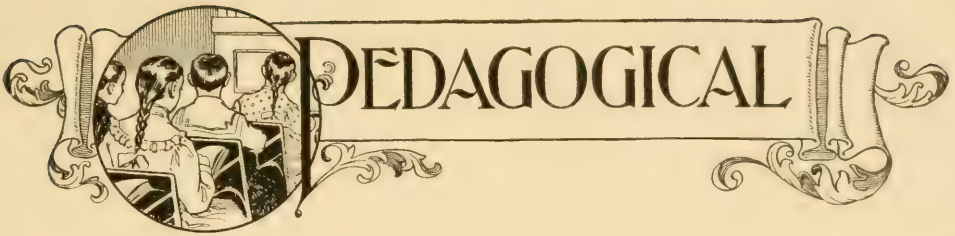
"You are disappointed," he said, "because so many expect so much more than they can see, and so few seem interested. You say that curiosity prompts them to come once or twice, and that a casual glance seems to satisfy them. I can explain. This is a place for mental pleasure and for the seeing of things with a mental eye. Many who have good mental eyes, or what are usually called brains, use them all day, and when the evening comes they desire a change. Another class has not yet learned to find either their work or their pleasure in the use of their brains. The success of this observatory will depend partly upon your ability to teach the people to see things mentally, and largely upon their ability to find pleasure in such seeing."

The Sound Beach Astronomical Observatory is Completed and All Bills are Paid

The Total Cost.....	\$1,239.63
Total of Contributions.....	1,042.43

Borrowed from the AA General.....\$ 197.20
(Our friends will kindly aid on this amount that is needed for current expenses of the general work of The Agassiz Association.)

Classified Contributions.		Paid	
Sound Beach	\$ 101.85	Telescope and Accessories ..	\$ 778.00
Greenwich	221.00	Clerical Work, Printing and	
Stamford	152.00	Postage	98.25
Elsewhere in Connecticut ..	59.00	Foundation, Building and	
California	1.00	Furnishings	363.38
Maine20	Total Cost	\$1,239.63
Massachusetts	176.00	* * * * *	
Missouri	10.00	Continued Contributions.	
New Jersey	20.00	Masters Edwin Warren and	
New York	113.50	Robert Newton Lewis,	
Ohio	179.88	Greenwich	\$ 1.00
Oklahoma	5.00	King's Daughters' Circle of	
Pennsylvania	11.00	Sound Beach	5.00
Texas	2.00	Mr. John H. Sage, Portland,	
Total Pledged	\$1,052.43	Conn.	5.00
Unpaid	10.00	Total	\$ 11.00
Collected	\$1,042.43	Previously acknowledged ...	\$1,041.43
Borrowed from the AA		Grand Total.....	\$1,052.43
General	197.20		
Total Cost	\$1,239.63		



Snowflake Paper Cutting.

Erie, Pennsylvania.

To the Editor:

I am pleased to send you my plan for a snowflake paper cutting lesson, trusting it may give some one a little pleasure, as I assure you we have had much in doing it.

I gave the lesson to the children in the Fresh Air school, and two weeks after that, Miss King, the teacher, asked the children to write about something they had learned recently. The day you gave your lecture here and mentioned snowflakes, she told me of one boy's composition. At my request she gave it to me and I am sending it to you herewith that you may see the lesson gave a good impression.

* * * * *

Winter.

Winter is the season that all boys and girls like. December is the best month of the twelve, because it brings the ice and snow.

Snow is like the milkweed seed sailing around in the air, they move so quietly without a sound. Because the snowflakes help each other and work together they make a big drift.

If boys and girls would follow the example of tiny snowflakes they would accomplish many things.

Reed Stinson.

* * * * *

Beside the interest and attention in the drawing and cutting, I am sure we can lead the children not only to love the beautiful literature of Emerson, Bryant and Thoreau, but also to learn something of the laws of nature and in so doing to be inspired with love and reverence for the Creator.

My plan for teaching snowflake paper cutting is as follows:

I give each pupil several pieces of thin white paper three and one-half inches square, pencil and scissors. We fold the square as in Fig. II, fold again as in Fig. III and draw a curved line as in Fig. IV. With the scissors we

cut on the curved line without unfolding the paper. We then fold it in three equal parts as shown by the dotted lines in Fig. V, draw as in Fig. I (a), and cut on the lines. The folded edges are held firmly together while cutting and we turn the paper, not the scissors. The paper is then carefully opened.

I have a magazine illustration showing Mr. Bentley and the apparatus that he uses to photograph snowflakes, also ten of his photographs which I show to the children and lead them to discover that each snowflake has six points and six sides. I tell them that Mr. Bentley says he has made over two thousand photographs with no two alike, and again quoting from Mr. Bentley give them the following facts:

"Water is nature's most precious gift to earth, next to life itself. Hence it is peculiarly fitting that this most beneficent substance should assume such beautiful and varied forms.

"Of all the water forms snow is the most remarkable. Snow crystals (snowflakes) form at various heights from a few thousand feet to several miles. Their size is ordinarily between one-fourth and one-twentieth of an inch in diameter.

"All have six points and six sides and the mysterious laws that govern in cloudland seem to decree that the rate of growth shall determine the structure. Those that grow rapidly assume open, branching forms, while those that form slowly are more solid."

Before beginning the lesson, the following quotations are placed on the blackboard:

"Help one another," the snowflake said,

As it slowly sank to its fleecy bed.

"One of us here would not be felt,

One of us here would quickly melt,

But I'll help you, and you help me,

And see! what a splendid drift there will be."

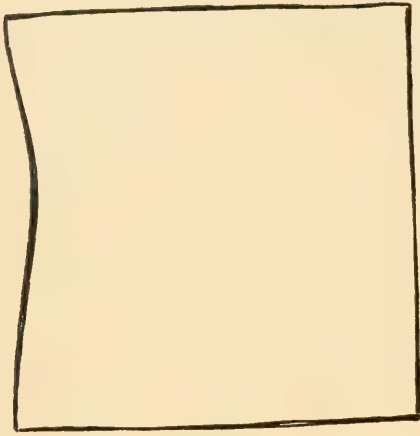


Fig. I.

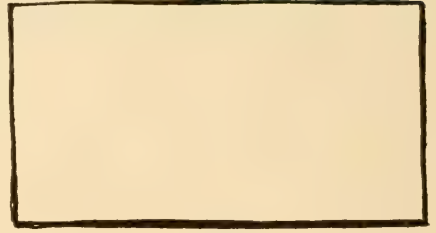


Fig. II.



Fig. III.

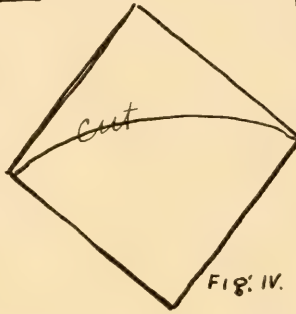


Fig. IV.

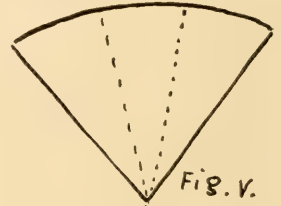


Fig. V.



Fig. I.



Fig. II.



Fig. III.



Fig. IV.

DIAGRAMS FOR FOLDING AND CUTTING THE PAPER FOR SNOWFLAKE DESIGNS.

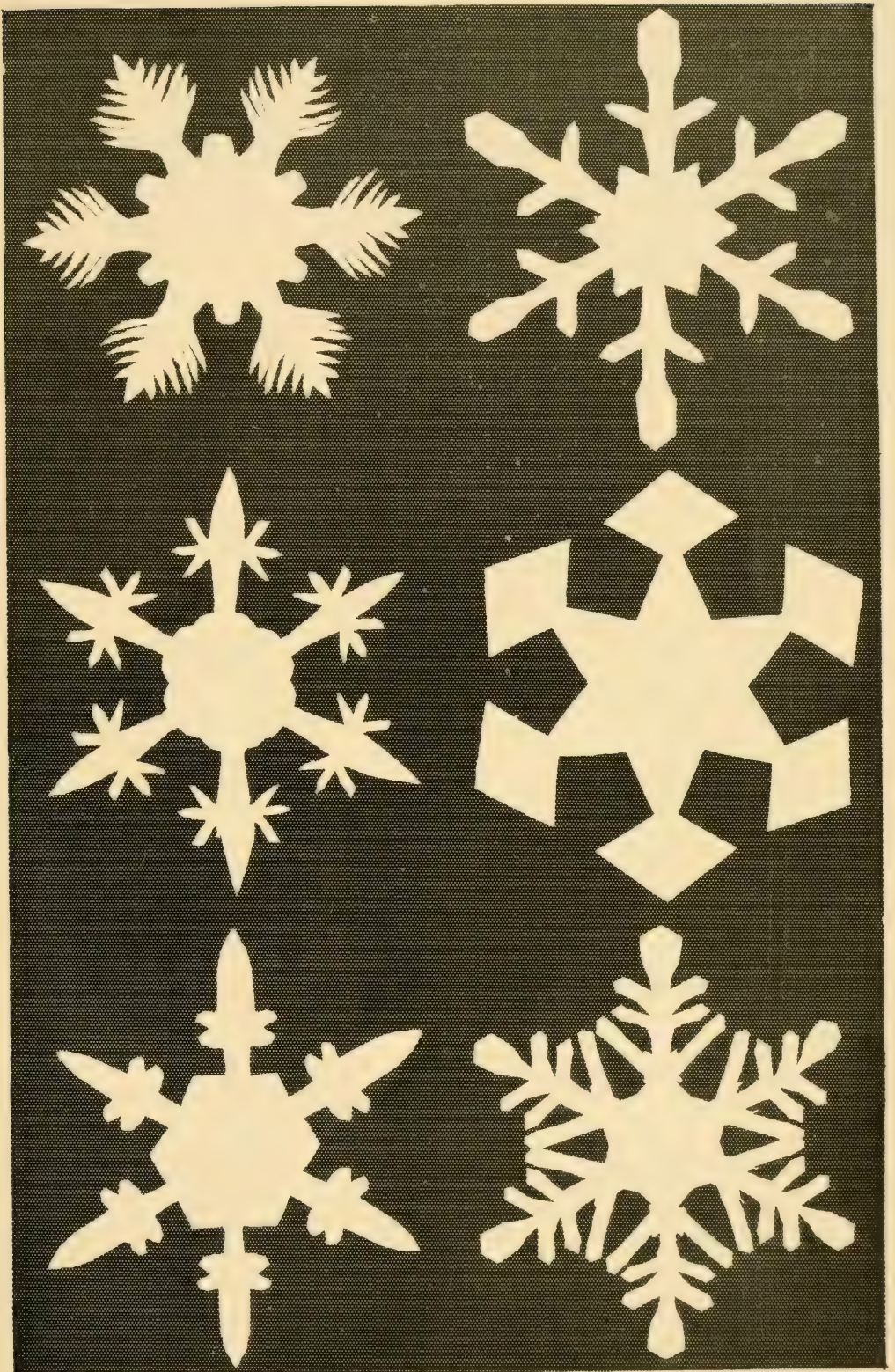
There is nothing handsomer than a snowflake and a dewdrop.—Thoreau.
 Delicate snow stars out of the cloud,
 Come floating downward in airy play
 Like spangles dropping from the glistening crowd.

That whitens by night the milky way.
 —Bryant.

See that thou bring not to field or stone
 The fancies found in books;
 Leave author's eyes and fetch your
 own,
 To brave the landscape's looks.

—Emerson.

Sincerely,
 EMMA E. CROOK.



SNOWFLAKES CUT FROM PAPER BY PUPILS OF ERIE, PENNSYLVANIA.



Nature as well as Revelation Reveals God.

BY EDWARD F. BIGELOW, ARCADIA: SOUND BEACH, CONNECTICUT.

For forty years the motto of The Agassiz Association has been *Per Naturam ad Deum*; that is, to find God, one should first question nature. Finding in that respect gives a firmer foundation than revelation alone. Let nature tell her own story of the Deity that produced her. We have always laid especial stress upon this. Her answer is more influential than human arguments. We have never displayed the slightest disposition to argue that nature is a revealer of God. We have deemed it sufficient to let our motto announce the self-evident proposition.

Within the last few years many pleasing instances have come to the editor of this magazine, of the manner in which the Roman Catholic Church is emphasizing the fact that to read nature before reading revelation is a fruitful method of becoming acquainted with God.

After years of careful seeking for any manifestations in the Protestant Churches of emphasis placed upon the observation of nature as a revealer of God, we must confess that we have found little. A few years ago, the Rev. Mr. Priddy of the Methodist Church, Stamford, held a prayer meeting devoted to nature. In his report of this unique effort he spoke of its remarkable success, but, so far as we know, the meeting has not been repeated.

Two churches in Stamford, the Presbyterian and the First Congregational, have been favored by their pastors with sermons on nature as a revealer of God, and others are promised, or the subject has been referred to favorably.

The prominence given to the observation of nature as a part of religious instruction in the Roman Catholic Church has been strongly impressed upon the editor by the numerous requests that he has received for lectures to be delivered at Sacred Heart Convents and similar Institutions. Within a year he has twice visited St. Mary's College, Monroe, Michigan, there spending several days in calling the attention of almost three hun-

dred pupils to the pursuit, and on the second visit interesting some six hundred nuns by similar addresses. Courses of lectures have been delivered for several successive years in the Sacred Heart Convents of New York City, and invitations have been received from convents in Detroit, Rochester and Providence. No one that loves nature and believes the motto of The Agassiz Association can fail to appreciate, nor to be inspired by the prominence that these Catholic Institutions are giving to the observation of nature and to the study of natural science.

Recently the editor, during a call on Messrs. Williams, Brown & Earle, a prominent firm of opticians in Philadelphia, made this inquiry, "Do you think that microscopy is holding its own?"

The reply, after a moment of careful thought, was, "I think that the use of the microscope in strict biology may be increasing in some of our educational institutions, but it is decreasing as a matter of popular interest. I am glad to state, however, that astronomy is picking up, not only popularly but especially in Catholic Institutions."

Other inquiries elsewhere confirmed these statements. If there is any one Institution that has the right, or even the desire to put revelation before nature, it should be the Catholic Church which for so many years was the sole conservator of Holy Writ. To the naturalist the encouraging fact is that this church states in the canon adopted at the general council in 1870:

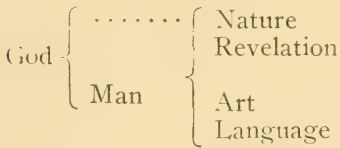
"If any one shall say that the true God, Our Creator and Lord, cannot be certainly known by the natural light of human reason through created things; let him be anathema."

The prominence thus given to the observation of nature is also voiced in the January number of "The Catholic Educational Review," in an interesting article entitled, "Physical and Social Heredity." The writer says:

"Mental life in common with all other forms of life grows by what it feeds upon. Now the food required for the nourishment and development of man's conscious life is to be found in the following four sources: First, in the truth and beauty and goodness of the Creator as reflected in nature; secondly, in the direct revelation of the truth and beauty and goodness of God that reaches the individual through revealed religion; third,

in art regarded as the concrete embodiment of human thought and action: fourth, in the manifestations of the human mind and heart that reach the individual through the arbitrary symbols of speech.

"The relations of these sources to each other and the unity which underlies them may be illustrated by the following diagram:



"God is here represented as the single source of the four mental food elements. He is at once the author of man's being and the ultimate source of all that ministers to his life and to his development. He reveals Himself to man directly through nature and through revelation, and indirectly He also reveals Himself to every child born into the world through man's works and through man's thoughts as expressed in human speech.

"*Nature precedes revelation* even as the concrete embodiment of human thought precedes human language."

With denominational matters this magazine has nothing to do, but with the motto of The AA—*Per Naturam ad Deum*—it has a great deal to do. It is therefore glad to mention, as an inspiring example to others, the prominence that this old church is giving to nature, as a means of divine revelation, and as a revelation that leads *ad Deum*.

Earth's crammed with heaven,
And every common bush afire with God.—Mrs. Browning.

"But this I do say, and would wish all men to know and lay to heart, that he who discerns nothing but Mechanism in the Universe has in the fatalest way missed the secret of the Universe altogether. That all Godhood should vanish out of men's conception of this Universe seems to me precisely the most brutal error,—I will not disparage Heathenism by calling it a Heathen error,—that men could fall into. It is not true; it is false at the very heart of it."—Carlyle.

Nature First in Religious Education.

The National Education Association has recently published a pamphlet containing a prize essay entitled, "The Essential Place of Religion in Education," the outcome of an offer of one thousand dollars by a resident of California for the best essay on the subject. The prize was awarded to Charles E. Rugh, Professor of Education, University of California, Berkeley, California. Professor Rugh says:

"The specific means for developing the child's consciousness of kinship with all things, all persons, and ultimately making him conscious that he is a child of the 'All Father,' may be classified under three heads: (a) The world of things or nature, sometimes called the 'works of God,' (b) the world of persons, the part of God's work described as distinctly made in His image, and (c) His express and distinctive revelations worked out by seers and prophets who express their experiences with God for the benefit of humanity. The first group is the basis of the natural sciences and of man's conquest of nature."

It will be observed that his classification, accepted by the judges, places nature first; person, second, and revelation, third. One of the essays that received honorable mention likewise places nature first as introductory to religious instruction, and amplifies the point as follows:

"For the young child, as for the young races, nature study is a source of thought concerning God. Let the teacher connect every new wonder, as it draws upon the child's consciousness, with the idea of God. At the end of a lesson on flowers, it will not blunt but it will heighten interest for the teacher to repeat, and lead the children to memorize the biblical passage beginning, 'Consider the lilies how they grow.'

In connection with the study of trees the teacher may call attention to the kind of man who, according to the First Psalm, is like a healthy tree—'Blessed is the man that walketh not in the counsel of the ungodly—and he shall be like a tree planted by the rivers of water.' After a summary of the many phases of nature, the One Hundred and Fourth Psalm may be read. This psalm is a great song praising the God who shows Himself in so many ways; the central thought is expressed in, 'O Lord, how manifold are thy works! Praise ye the Lord.' The Psalms are

particularly adapted for study in connection with natural science because they are so rich in figures of nature."

These statements may be accepted as authoritative for several reasons: First, the author of the essay containing them received a large prize. Second, competent authority passed judgment on the contestants. Third, the prize was awarded by the National Education Association, one of the highest, most influential and trustworthy institutions in the country. All of which illuminates more brilliantly, if possible, than they were previously illuminated The Agassiz Association, its work, and the motto that it has had for forty-one years: *Per Naturam ad Deum*.

"But though God conceal himself from the eyes of the *sensual* and *lazy*, who will not be at the least expense of thought; yet to an unbiassed and attentive mind, nothing can be more plainly legible than the intimate presence of an allwise Spirit, who fashions, regulates and sustains the whole system of being."—Berkeley.

"Earth's most exquisite disclosure, heaven's own God in evidence!"

—Browning.

The Highest Ideals.

"The Rural New-Yorker" in a recent issue has the following brief, but important editorial:

"'Live and let live' You practice this and preach it. Why not take it for a motto? It is about equal to the Golden Rule.

"Connecticut.

H. B. B.

"We would like to amend this motto a little and make it, 'Live and help live.' It is not quite enough to keep hands off and let a brother carry his own burden. Let us all try to help him carry it."

That is our ideal and should be yours. That is the reason for the existence of an Association. All the world should be an Association. When that idea is put into practice, there will be no more war, no more bitter sayings, there will be nothing but "Peace on earth and good will to men."

The object of informal nature study is to put children directly in touch with the beautiful and wonderful things which are within their reach. Its lesson-book is everywhere, its time is every time, its spirit is wonder and delight.—Janet Erskine Stuart in "The Education of Catholic Girls."



FROM FEBRUARY NUMBER.

This drawing was made and contributed to The Agassiz Association by the Reverend Lewis W. Barney, Ph. D., Sound Beach, Connecticut.



Our Maryland Avenue Chapter.

During the past year, the Maryland Avenue Agassiz Association Chapter, Baltimore, Maryland, selected an interesting work—the study of moths. For our textbook we used Gene Stratton Porter's "Moths of the Limberlost." The book is entertaining, not too scientific—Mrs. Porter calling herself "not a naturalist but a nature lover"—and the colored illustrations are beautiful. These photographs were taken by the author herself, in the natural habitats of the moths, and carefully colored to correspond with the living insects. The shades of even the tiniest markings are faithfully reproduced, so that each picture is not only a study of nature but a work of art.

Perhaps our practical work has been the best of all our work. Some of the members kept the caterpillars under a wire screen, feeding and studying them until they spun their cocoons. These will open in the spring.

We went on field trips in search of the moths, sometimes returning home triumphant with a particularly lovely specimen, and later for the cocoons. These we keep, as Mrs. Porter instructs us to do, in as nearly their natural environment as possible, giving them some sun, and occasionally a sprinkling that is supposed to be rain. Think of the treat awaiting us in the spring!

All our specimens are brought to the meetings to be admired and studied, and we have found some beautiful ones. A field trip gave us a perfect "Pride of the Lilacs," *Attacus promethea*, if you wish to be scientific. A giant Polyphemus we found under an arc light in a busy street, and early in June, a Luna moth, the "Moth of the Moon," perhaps the loveliest of all, was captured on a neighbor's window pane.

Though our chief interest has been in the studying of moths, we have not neglected other things. Our field trips bring us to many interesting phases of

outdoor life. We keep a sharp lookout for oddities in nature. We have found a slender, corkscrew shaped tree that grew with a thick vine twisted around it. The vine is gone, but has left its mark both in the bark and the shape of the tree. In the early part of last year we were particularly interested in mineralogy, and collected a number of rocks containing ore. While we were working along this line we came upon rocks bearing the fossil imprints of ferns, some of them delicate and beautiful.

One of our most interesting, incidental studies was that of mosses. We were astonished to find so many varieties. We showed numerous specimens mounted, some on cardboard and some on bark, some of them very odd in appearance. The branching, satiny kind look lovely against the brown wood. They kept their color splendidly.

Another good program was prepared with glowworms as its subject. Our ideas of them were vague, so we took the opportunity for enlightenment. We even made a field trip at night to look for them!

We have added some new members to our Chapter, and are looking forward to a busy and happy year of study.

MAMIE J. ITZEL, Secretary.

"For God appears the greater to every man in proportion as he has grasped a larger survey of the creatures: and when his heart is uplifted by that larger survey, he gains withal a greater conception of God."—St. Cyril of Jerusalem.

It is a joy to me to unfold beauty hidden away in its own modest mask of commonality. We are "queer mortals." We tread the carpet and pluck the fruit in the Garden of the Gods all unconsciously, at times, and then call ourselves wits, philosophers, and what not!—Will Webb Tuttle, Muncie, Indiana.

Concerning Bears and Deer.

BY JOSEPH W. LIPPINCOTT, BETHLAIR, PA.

By far the strangest thing I noticed about the wild bears in the Yellowstone National Park was the fact that, when they came to the hotel garbage piles to feed, they paid no more attention to the crowd of onlookers than if it did not exist.

Early in the evening a black bear or two would drift quietly out of the woods and begin to pick over the tin cans directly in front of the visitors. One feels a bit queer when they appear, especially as they nervously look up every moment or two and often listen and perhaps scent the evening breeze, but in spite of fears you quickly see that they look only in the direction of the woods, where they and all the other bears must come from.

I saw one bear dash almost into the visitor's gallery just because he heard or saw another bear coming out of the woods a hundred yards away. At another time two silver tips appeared in the distance and three of the five black bears already on the scene slunk towards the people in very apparent fear and then left the place entirely, with their attention ever riveted upon the woods. This kind of thing was noticeable every evening and soon gave one the idea that it was some member of their family and not man that the bears felt uneasy about.

Perhaps I would not have thought about this after leaving the Park had I not this spring observed the same habit in wild deer that came to feed in a New Jersey alfalfa field. The deer, particularly in bright daylight, feared something that they expected to come from the woods behind them. The several people watching from the next field scarcely interested them.

I watched on a number of afternoons in April and found, just as with the bears, that it was others of their kind that they were so intently looking for. Once a doe came far into the short alfalfa growth and fed until her nervous ears caught the sound of two approaching deer. Instantly she became more agitated, trotted about and finally ran to them, although they were in another field beside the woods. Then, instead of greeting them like friends, the doe rose on her hind legs and put them both to rout with furious jabs of her front feet. The evening seemed to be spoiled for her for she made no further attempt to eat, preferring to gaze

into the shadows of the woods. One or two deer always were nervous until more came out, but a herd of from six to ten—the most seen at once—was nearly immune from the woods gazing habit.

Interested in Nature Study.

Miss Smith, a teacher of biology in a certain high school, relates this incident in connection with an interest in nature manifested by a teacher in the public schools. This supposedly new convert to the value of nature study came to Miss Smith, an enthusiastic and thoroughly proficient teacher of biology, to borrow a book on nature study.

"What do you wish to study?"

"Oh, never mind what. I just want any book on nature study that you may happen to have."

Miss Smith, surprised at so general a request, demanded more explicit information. The reply was, "Oh, I am not particular as to what book, only a big, nice looking book on any nature subject. I want it to lie on my desk where it will look well when the superintendent calls."

Kansas has 80 species of wild mammals; Nebraska 94; Colorado 152; Texas 182; and California 369.

A prominent American bacteriologist has lately expressed the opinion that fertilizers applied to the ground, though they aid the crops directly, have at least as much indirect effect by nourishing the beneficent micro-organisms of the soil.

The Blizzard.

BY CAROLINE CLARK HINTON, HARTFORD, CONNECTICUT.

Blinking snow
And wind and cold;
Swaying branches tossed about
Like skeletons upon a string
By childish hands.
Downy balls of snow
Like nests
Deserted
In the twilight of the autumn's evening,
Upon the vines
The snow is spread,
White arms that curve and stretch,
A shining octopus.
While through the mist
A golden light
That glints and sways and lives;
Snatched from the darkness,
Concentrated.
God's gift to man.

What The Agassiz Association Offers.

From the Charter of Incorporation:

"The purposes for which said corporation is formed are the following, to wit: the promotion of scientific education; the advancement of science; the collection in museums of natural and scientific specimens; the employment of observers and teachers in the different departments of science, and the general diffusion of knowledge."

The Agassiz Association is a Clearing House for information on any phase of nature or of natural science. It places at your convenience the total of all human knowledge pertaining to the natural world. This it is able to do by having a Council of experts in every department of natural science. If anybody knows it, you may know it by merely inquiring.

The AA publishes observations, answers questions, identifies specimens and creates and increases a knowledge and love of nature. This work is not limited to its Chapters and Members. *THE GUIDE TO NATURE*, a monthly magazine, the official organ of the Association, is devoted to commonplace nature with uncommon interest.

LOCALLY.

ARCADIA offers to Stamford, Sound Beach and Greenwich, and to visiting parties from other places, the facilities of a general natural history Institution: The beautiful Agassiz Grove.

A well-equipped Reception Room. Nymphalia. This is a nature study park, so named because it is the home of Nymphs of nature study: Love, Study, Interest, Enthusiasm, Beauty. Begin with Love and through the series we find Beauty. "We love things not because they are beautiful, but they are beautiful because we love them."

The Forest of Arden—more than one hundred acres of unexcelled picturesque wild forest and thickets, explained and explored by personal guidance.

Demonstrations in an apiary. Instructions in a biological laboratory.

Exhibitions with compound and projection microscopes unequalled elsewhere in the United States.

An astronomical observatory with a six-inch Clark telescope. This telescope is probably the only one dedicated wholly to the free use of the public.

What Our Expenses Have Been.

In the year ending March 31, 1915, our expenditures were \$6,046.97. Deducting Sundays and holidays this is an average of \$19.95 per day.

The President of The Agassiz Association receives no salary as President nor as editor of *THE GUIDE TO NATURE*. For some of the mechanical and business work on the magazine he has received this past year \$708.44 or \$13.62 per week. For the previous seven years he received not a cent even for this kind of work. Three members of the family that assist (some giving their entire time) have received no salary. The Bigelow family does not receive even free house rent. Birchen Bower and its part of ARCADIA freely used by the public is *not* the property of The Agassiz Association. The family pays for the use of the garden and the pet house. It will be seen that so far as the Bigelows are concerned, they give their time to the Cause to which the public is giving and is requested to give financial support.

These services have been unpaid because there has not been sufficient income with which to pay for them. Additional workers will be secured when the income is sufficient. The equipment could use to advantage many times the present number of workers. There is no limit to the general work; the local work, too, is pressing for an increased number of assistants.

Our Income.

1. Membership Fees. You are eligible for membership if you approve of the work as here outlined. Full particulars upon application.

2. Subscriptions and Advertisements. *THE GUIDE TO NATURE* is growing. It now has a circulation of three thousand. Help it grow. You may thus aid and extend our work.

3. Cash Contributions. These have come from all parts of the world, and have been an important factor in sustaining the work.

4. Rentals of Parts of ARCADIA. From the Bigelow family for garden and pet house. From Mrs. Blakely for the site of her Botany Bungalow. She owns her house, pays rental for land, her membership dues, and *gives* her services freely to botanical students.

Inspection and Cooperation.

The cashbooks may be inspected by any Member or Contributor. Every detail of the work will be made clear to any one. We need more money, and have full confidence that, with increased knowledge by our Members and friends, and by the public in general as to the exact situation, it will be freely given.

Here is a work of merit in the interests of humanity that should be properly financed for full efficiency. Nowhere else in all the world has so much been accomplished in forty years with so little money; nowhere has there been greater faithfulness, or more devoted service for the uplift, the education, the improvement of humanity.

Forty Years Past: Forever in Future.

The Agassiz Association was organized forty years ago on the grandest principle that ever associated boys and girls, men and women. It regards every individual as supreme, and has as common subject the Universe and its Maker. "Per naturam ad Deum" is its motto today as it has been for four decades.

The university, not the kindergarten, has always been the point of view. No one lines up a class and says, "Here is the game; I will show you how to play it;" no one tells you what clothes you shall wear, nor what thoughts you shall think. The youngest child is as free to see and to tell as is the eldest member of the Association, or the veteran technical scientist in his learned monograph, whose joy of seeing and telling in his way is no greater for him than is that of the beginner. In fact the veteran realizes better than the novice that he is only a beginner, that there is yet before him much for him to learn.

The Agassiz Association expresses itself in terms of peace, civilization, equality, and dignified self-respect. It regards no one as a "tough" and treats no one as needing reformation. It assumes that human nature is not bad but good. It exalts no one on account of his wealth, knowledge or station. The greatest thing to do is faithfully to serve others. There is no exaltation of

office. No chiefs have charge of inferiors. Every one is a chief when he unselfishly gives of the greatest thing in the world, his ability "to see and to tell," for the benefit of others, not to confer a favor in the seeing and the telling, but for the PRIVILEGE of doing it.

The Agassiz Association regards every member as innately kind. The Agassiz Association embodies the law of love, not the love of law. Its kindness to man begins when he is a boy. To have him love a horse, is better than to punish him in court for having pounded a horse.

The Agassiz Association requires no course of study. Every member is a teacher. Even the youngest goes directly to Nature's storehouse, helps himself, and for additional joy, points the way to some one else. A child, as well as a man, may play on the ocean's edge, and each may be the teacher of the other, and the joy of each will inspire the other.

No one outgrows The Agassiz Association. In old age it is not remembered as a thing for boys or girls, but the enthusiasm of youth grows stronger with age. As Dr. Van Dyke has truly said:

Let me but live my life from year to year.

With forward face and unreluctant soul,

Not hastening to nor turning from the goal;

Not mourning for the things that disappear

In the dim past, nor holding back in fear

From what the future veils, but with a whole

And happy heart, that pays its toll
To Youth and Age, and travels on
with cheer.

When members of The Agassiz Association go to walk, they are not sharp-eyed with one eye and blind in the other. "Everything is 'fish' that comes to the net of a naturalist." A bird is indeed of interest but so is the tree through which it flies or where it sings its song.

The Agassiz Association seeks to develop mind and heart. It appeals to the thoughtful rather than to the thoughtless.

Individual members and organized Chapters of members are free to do things in their own way. It has never been in the glare of great public popularity. The Agassiz Association considers it more important to observe than to be observed.

The Agassiz Association and Its Home Are for You.

To create and increase a knowledge and love of nature. You are not too rich, nor too poor; not too wise nor too ignorant; not too young nor too old, to share in their benefits."

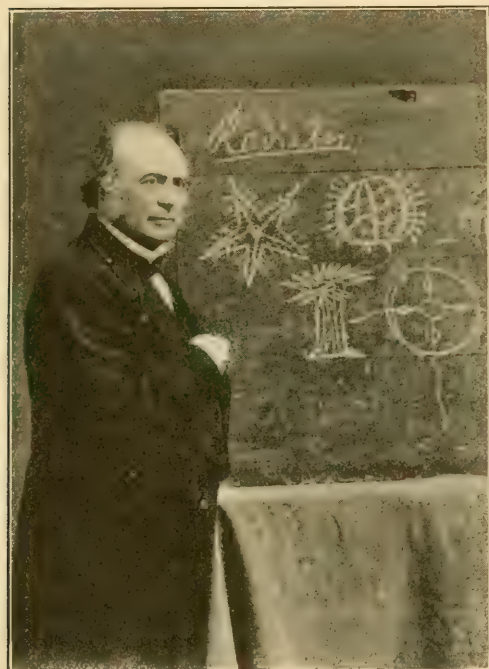
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To members (and their accompanying Friends): All Days. Special personal attention, if an appointment is made by telephone or otherwise.

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AGASSIZ AS A TEACHER.

HE spoke with intense earnestness and all his words were filled with that deep religious feeling so characteristic of his mind. For to Agassiz each natural object was a thought of God, and trifling with God's truth as expressed in Nature was the basest of sacrilege.

The old barn on the island had been hastily converted into a dining-hall and lecture-room. A new floor had been put in; but the doors and walls remained unchanged, and the swallows' nests were undisturbed under the eaves. The sheep had been turned out, the horse-stalls were changed to a kitchen, and on the floor of the barn, instead of the hay-wagon, were placed three long tables. At the head of one of these sat Agassiz. At his right hand always stood a movable blackboard, for he seldom spoke without a piece of chalk in his hand. He would often give us a lecture while we sat at the table, frequently about some fish or other creature the remains of which still lay on our plates.—David Starr Jordan in "Agassiz at Penikese."

Chapter Organization Expense.

Entrance Fee	\$1.25	
Handbook, "Three Kingdoms"...	.75	
Engraved Charter, in tube.....	1.00	\$3.00

ANNUAL DUES—PAYABLE IN ADVANCE.

The Annual Dues for Chapter ..	\$2.00	
Annual Dues Members of Chapter Members @ 5c each	—	\$ —
Total Necessary Expense to Chapter upon Joining the Association		\$ —

Corresponding Member's Expense.

Entrance Fee	\$0.25	
Handbook, "Three Kingdoms" ..	.75	
Certificate of Membership50	
Annual Dues	1.50	\$1.50
		\$3.00

Student Members are required to make a report at least once a year. This report should contain not only a statement of work done, but of "the promotion," "the advancement," etc. See quotation from Charter. We are to help others as well as ourselves. Extend the influence of the AA.

The Annual Dues include payment for subscription to The Guide to Nature.

Cooperating Memberships.

Sustaining Member (annually)	\$5
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Founder	\$5,000
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The Guide To Nature

1916

APRIL

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EDWARD F. BIGELOW

MANAGING EDITOR

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The nerves of the earthworm transmit impulses at the very slow rate of an inch a second. Certain large nerves, however, attain to the more respectable speed of a yard and a half in the same time. One hundred feet a second is the rate in man.

The Pleasure of Expression.

There is a joy in expressing one's self in words, and a pleasure in the use of one's skill in the act of doing things. In making a collection, the naturalist expresses his desire to collect, and it is often with pride that he shows the results of that expression to his friends. The same principle applies to the photographer that desires to express his ability to portray nature on the sensitive plate. There is the same desire for expression in working with wood, whether tinkering at repairs about the home, or in making something new. A music rack, a shelf, a box or a cabinet for specimens, a chair, or other article of furniture, is a method of expression, and in the act of making there is joy. As one likes to own a good anastigmat lens or a modern collecting case, so

there is a happiness in having perfect tools and a convenient place in which to keep them. Both of these requisites are supplied by Hammacher, Schlemmer & Company of New York City. Their tool cabinets are a delight to the lover of tools, and what average man or boy does not delight in handling and especially in owning and caring for really good tools?

To save the fur seals, it has lately been pointed out, one thing will have to be done at once; that is, to put the matter in the control of the Department of Agriculture. The Treasury Department tried it—and made a mess. The Department of Commerce took over the problem and did rather worse than its predecessor. But the Department of Agriculture, with its Biological Survey and its Division of Animal Industry might do something. Seals are, after all, not essentially different from sheep or cattle or swine. The methods and the men who handle successfully one sort of creature are the best fitted to deal with another.

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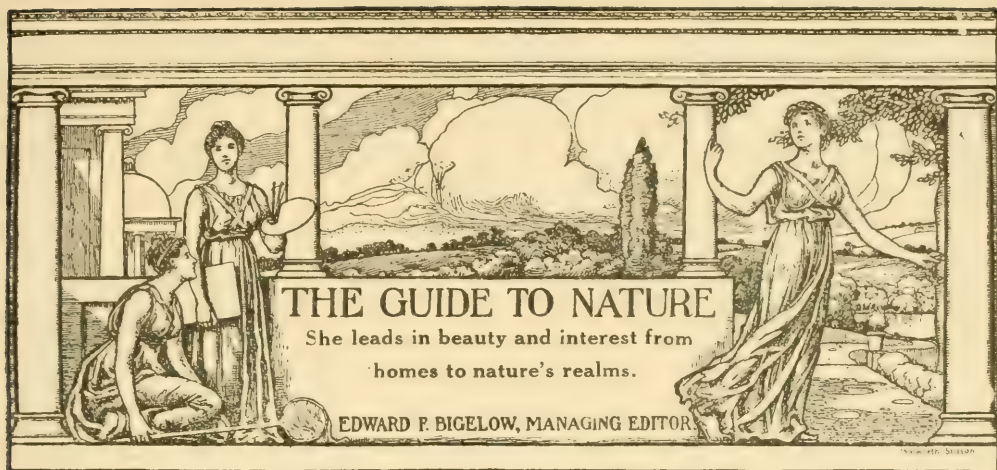
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Volume VIII

APRIL, 1916

Number 11

How We Tamed the Flying Squirrels.

BY R. HERTZBERG, STAMFORD, CONNECTICUT.

Three years ago a number of bird houses were set out among the trees surrounding "Knokik Kamp" in High Ridge, Connecticut. For many weeks expectation ran high and much good-natured rivalry was indulged in to get the first look at the expected tenants. For a long time nothing happened, but one day the boy noticed a leaf sticking out of the opening of the house in the cedar, and he asserted that the house had a tenant—that a bird was making a nest in it. The idea was ridiculed and he was informed that a leaf had been blown into the opening. But how we did watch that opening!

The next morning there was no mistaking it. The house was occupied; the opening had been almost closed by a mass of leaves. What had done it? We guessed from condor to least fly-catcher. Nothing was seen to enter or leave the house, yet the mass of leaves was daily getting larger. We dared not take the house down for fear of frightening off our welcome guest, yet the suspense must be broken.

One evening when we were indulging in our usual guesses one of us saw the leaves move in the opening and a gray head, with large eyes protrude from the doorway. "A squirrel." "No,

it's too small." But suddenly our visitor darted out of the box and up the cedar to the topmost branch, and without an instant's hesitation launched himself into space, to land on an oak tree a hundred yards away. The secret was out. Our house harbored a flying



"SOON TOOK THE NUTS FROM BETWEEN OUR FINGERS."

Photograph by Mr. John J. Schoonhoven

squirrel. The next morning was spent in putting up projecting boards from the railing and in a trip to town for hazelnuts. Every evening a vigil was

kept in the hope of getting another glimpse of our guest. For several weeks we did not see him, yet every morning the boards were empty, the nuts were gone. Finally the little creatures—there were two, finding that no harm came to them, ventured out

“Hello! Did you bring my supper?” The supper was there. Before long he found it and came again and again and his parents or brothers and sisters were with him. This went on during all the long, lazy, happy summer and by fall our “Babies,” as we now called



DR. HERTZBERG'S HOME NEAR TO NATURE—"KNOKIK KAMP."

of the house a little before dark, and occasionally would show us a flight. As time went on they became bolder and one evening one ventured on to the board while we were sitting nearby and in a great hurry scampered off with a nut. This was repeated a number of times, the little fellows coming oftener and earlier. It was now getting late in the fall and we had to leave Kamp Knokik. A large stock of nuts was left and, as the acorn yield was plentiful, no apprehension was felt for our guest's winter food supply.

You may imagine our pleasurable surprise when, the following year, we found both houses occupied. Nuts were that evening placed on the boards. In the morning they were gone. The next evening a little furry head with sharp ears and big eyes peeped out just before dark and seemed to say,

them, came every evening just before dark and partook of the feast spread for them. To our intense gratification they kept coming a little earlier, so that just before "Kamp" breaking time arrived, the little creatures entertained us with fifteen or twenty minutes' flight each evening. So the second summer came to an end.

Large expectations were held for the next year. The spring of 1915 came, and to Kamp we went, armed with a big basketful of hazelnuts. The first look was at the houses. The babies were still there. A Lucullian feast was spread for them, and to our amazement Baby poked his head out of his doorway about a half hour before dark and lost little time in examining his supper. This he did by rushing to the board, picking up a nut, quickly sitting on his haunches, and taking two bites

out of the shell. The friendship now progressed rapidly. Our Babies came earlier and we kept getting nearer and nearer the boards, when they were there. One evening one ran across my shoe to reach his supper. Then we tried to get them to take a nut from our hand. This we did by sitting perfectly still, the hand resting on the board with nuts in the palm. In a few evenings they were eating out of our hands. They came in broad daylight and soon took the nuts from between our fingers. From this on it was easy, by leaving the boards empty and with the nuts on the open hand, to coax them to run over our person. One evening one mistook my head for the trunk of a tree and landed full and square on the place where "only the hair ought to grow." Now, after three years of patient effort, our Babies were fully tamed. There are four of them.

There is nothing more charming than to see these gentle creatures cast themselves into space and in a long curve sail hundreds of yards through the air. When desiring to land, they suddenly flip up the head, drop the tail, and with a quick, graceful, upward movement perch head upward on the trunk of a tree. They are full of tricks and play together much like puppies or kittens, scratching and squealing and chasing one another. Often one steals the nut from the other's mouth. One evening before sunset we heard a great squealing outside the Kamp. With the exclamation, "Something has got the Baby!" we rushed out, only to find his highness perched on his board and calling for his supper. Another evening, when all but the last nut had been taken off the board, I saw one of our Babies come down, get the nut and run away. Suddenly he reappeared and tried with all his might to push the nut between the edge of the board and the tree. His action was so unusual that I examined the nut and found it to be a pignut. The rascal evidently desired to express his disapproval of such food by promptly returning it. The accompanying flash-light photographs will show how tame our Babies are. We can scarcely await the time when we shall once more see them poke their little heads out of the opening of their houses at the shaking of a handful of nuts.



TWO AT ONCE—GETTING WELL ACQUAINTED.

Some Local Geology.

BY W. C. BANKS, STAMFORD, CONNECTICUT.

To trace the origin of our present land surfaces, and the causes to which they are due, is an interesting study. The expression, "the everlasting hills," is a convincing figure of speech, only, unfortunately, it is far from being true. All our present surface features are the result of a long series of changes, reaching back in time to an original molten state of the rocks. However, we need not go quite so far back, but accepting the present rock masses as an origin, we will try to determine through what causes and processes of sculpturing our landscape has attained its present aspect. Its most noticeable feature is the strongly marked north and south trend of our hills and valleys. This is due to the fact that during the Glacial Period the course of the continental ice sheet was northwest and southeast; the drainage too before this time was approximately in the same direction, toward the ocean, so that the hills and valleys have, in general, the same trend. The result was that the ice ploughed out the preexisting valleys, and filled and rounded the irregularities of the hills in the same gen-

eral direction. An examination of the structure of our local hills shows that they are made up of rock masses more or less rounded and modified by glacial action, together with enormous masses of boulder clay or till—the ground moraine of the ancient ice sheet. Some of our hills are largely formed of such derived materials. An artesian well at Noroton Heights, not far from the Stamford boundary, passed through one hundred and thirty-seven feet of boulder clay and, at the bottom, through gravel, apparently river gravel, before entering rock. This, perhaps, was anciently a river valley, filled and obliterated by the glacial ice. It would be difficult to reconstruct in fancy a picture of this region before its burial beneath the ice, but our hills and valleys modified and changed, as they undoubtedly have been, are strongly marked, and for the most part are ancient features.

The original drainage direction was determined by the general slope of the land toward the ocean, and while it was probably always approximately as it is at present, we should remember that some thousands of feet of rock have been removed from the surface since first the waters began to flow from our highlands toward the sea. The original elevation probably dates from the Taconic Revolution, at the close of the Ordovician Era, when the Atlantic border of America was first elevated above the waters as a long range of hills. This region also probably shared in the later elevation at the close of Paleozoic time, when the Appalachian Mountains were upheaved from the sea. It may since have been more than once submerged, but the absence of stratified drift makes this doubtful. The modified drift is of Champlain age, and extends in a level belt along the shore at a height of twenty feet or less above high water mark. The level plain on which the business part of Stamford is built, and extending to the hills, is an instance. This is an offshore deposit of reassorted boulder clays and detritus, borne seaward by the flood waters of the retreating ice sheet. The surface features of a region are determined by the nature of the underlying rock. A soft, yielding rock gives smooth contours, in striking contrast to the rugged character of the scenery in a country of trap rock or granite. Our native rock about southern Stamford and the contiguous territory east and west is mostly

a dark granite, altered by regional metamorphism into a banded granite gneiss. Out side of this particular locality, it is found widely distributed over Fairfield County, and is everywhere porphyritic in character, the feldspar being in distinct crystals, and giving the rock a more or less spotted appearance. This formation is largely penetrated by dykes of diorite trap rock. This is, or was, well shown near the canal on Henry Street, Stamford. This dike was originally a quartz diorite, but, sharing in the regional metamorphism that altered the surrounding granite, it has a more or less banded appearance, so that it is more properly a diorite gneiss.

Many years ago this locality furnished some good specimens of epidote that occurred in a large "pocket" at the contact of the diorite and granite gneiss. This dark granite gneiss, because of its jointed structure, produces a characteristic type of landscape, with rugged hillocks and angular masses of dark rock. From Westcott's Cove north through the basin occupied by Holly's Pond, we find another granite gneiss formation. This is more massive in structure and lighter in color than the other. It shows many masses of the coarse grained granite of the type called pegmatite. Across the northern parts of the townships of Stamford and Greenwich we find the Berkshire schist. This was originally sedimentary rock of Ordovician age, a sediment deposited when the greater part of the continent was submerged beneath the ocean. But the process of metamorphism attending the extensive crumpling and upheaval of the Taconic Revolution has altered it to a highly crystalline schist, and destroyed all trace of any fossils that it may have contained. Beside the native rock, the surface is everywhere strewn with rock material of foreign origin, borne along by the ancient ice sheet—granite, quartzite, amphibolite, and what not, making every stone wall a lithological museum.

The familiar fact that a pine forest killed by fire is followed by hard wood, has had many attempted explanations. The latest suggestion is that the ash from the burned wood makes the soil alkaline, the pine preferring a more acid condition. But after a few years, the potash leaches out, and the pines start again.

Rhododendron Falls in the Mountains.

BY JAMES D. BURTON, OAKDALE, TENNESSEE, FIELD WORKER, AMERICAN HUMANE EDUCATION SOCIETY.

Rhododendron Falls are located in the mountains at Oakdale, Tennessee, and belong to a residence known as "Brookcroft."

The falls are named after the beautiful flower rhododendron which line the banks of this stream in summer. About the cliffs and hills surrounding this

it could be made worth very much in any way.

A wonderful transformation has taken place. The grounds have been cleared, and a bungalow erected which is called "Brookcroft." The rhododendron, holly, hemlock, dogwood, and many other varieties of trees have been trimmed and improved. The winding mountain stream almost encircles "Brookcroft" as it makes its way around rugged and high cliffs, and gives a beautiful setting to the place



"BROOKCROFT" AT OAKDALE, TENNESSEE.

place may also be found in early spring, hidden under fallen leaves, the trailing arbutus, sweet and fragrant.

Until about a year ago this was an isolated and neglected mountain ravine. It was almost inaccessible because of no road. But Morgan County, through a three hundred thousand dollar bond issue, has just completed a new pike road through this mountain ravine, and connects with the Dixie Highway from Chicago to Miami, Florida. About the time the engineer located this road the writer acquired this property, consisting of about twenty acres. The citizens here didn't think

Near "Brookcroft" are a trio of springs which are enclosed in a rustic springhouse. The creek runs between the bungalow and the springs, and over this stream is erected a rustic foot-bridge.

This is the home of the Field Worker of the American Humane Education Society. Until a few years ago he was the General Secretary of the Railroad Young Men's Christian Association of Oakdale.

Oakdale is a railroad terminal on the Cincinnati Southern Railroad, extending through the mountains from Cincinnati to Chattanooga, Tennessee. It



RHODODENDRON FALLS, OAKDALE, TENNESSEE.

is the only municipal owned railroad in the United States. Railroad employees, numbering several hundred, make Oakdale a lay-over point on this system. The town has about 3,000 inhabitants.

Since the opening of the grounds about Rhododendron Falls it is a very popular place for the railroad men and their families, and for the mountain people residing nearby. Several picnics have been held on the grounds.

A bathhouse has been built at Rhododendron Falls, and a number go in swimming in the clear pool at the foot of the falls. Provision has been made for the public to get drinking water at the rustic springs belonging to "Brookcroft."

The owner is trying to make the place one of enjoyment and pleasure to all who visit it. The children especially enjoy the outings about this place.

Some of the needs at present are about 1,200 feet of two-inch piping to bring water from the falls to a fountain near the roadside, and a few bushels of grass seed to sow on the grounds about Rhododendron Falls in order to make a pleasant retreat for the children on their outings.

Public subscriptions will probably be started to make this possible before any great while. This is one way of helping the little mountaineers of the South to enjoy themselves, and to develop strong, Christian characters.

The Aquarium Society of Washington, D. C.

Nature students in general and those of the District of Columbia in particular, will be glad to learn that the Washington Aquarium Society has recently been formed under the most favorable conditions possible, thus giving every promise of a successful future. Dr. R. W. Shufeldt of the Medical Corps of the Army has been elected the society's active president, and we are sure that he will be as active and enthusiastic in this work as he has been for many years in a multiplicity of other scientific pursuits. Those interested in the aquarium may correspond with him at 3356 Eighteenth Street, Washington, D. C., for circulars and further particulars of this new organization.

Studies at the British Museum of Natural History made on great numbers of flies sent in from all parts of the country prove that, there at least, what most persons suppose to be the adult housefly hibernating through the winter is really nothing of the kind. The house fly, it appears, and the blue-bottle as well, pass the cold season as pupae. What is taken for the adult house fly proves to be another animal, an out-door insect, which comes into houses only to hibernate. Evidently our "swat the fly" campaign needs more basis of fact.

Living in the Country.

Each year finds a greater number of people in America erecting homes in the country. They are beginning to live in the golden today rather than in the past, or in the future. They have come to the realization that in the country, and only in the country is found the simple beauty of nature with her fragrance, her color, her atmosphere of peace, her silent inspiration in all her myriad forms. And she will gently find her way into the very soul of the dweller in the country, and through this communion he will be re-created, re-inspired, and re-strengthened.—“The Hoggson Magazine.”

With few institutions is the war playing sadder havoc than with the Zoological Gardens. At Budapest they have put the lions on short rations, and even then have had to feed them on the least valuable of the sheep and goats. The seals have had to be killed for lack of fish. The polar bears have met the same fate, except that a

thrifty management let out to local sportsmen the right to hunt them and thus turned a penny toward the funds. The Herbivora have fared better; but hay is so scarce that they have to live on wild chestnuts.

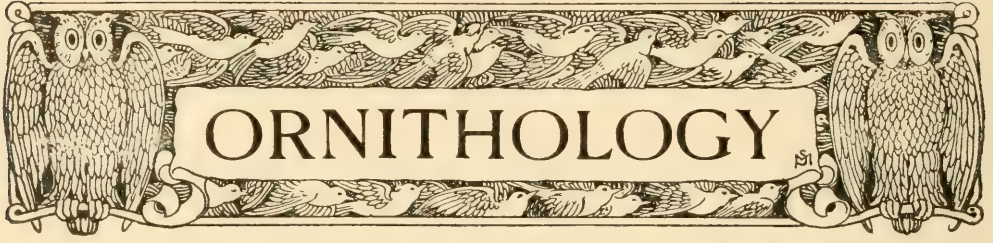
Natural Steam Caves.

BY H. E. ZIMMERMAN, MT. MORRIS, ILL.

In southern California are to be found the most wonderful steam caves in the world. They are in the vicinity of the well known arrow-head on the mountain side, on the east side of the Waterman Canyon. They are artificially formed and consist of tunnels cut into the bluff from the sides, roofs and floors, from which the arsenicated steam issues. The temperature of this steam is 202, the next hottest springs in the world being at Carlsbad, Germany, 164 degrees. Some idea of the heat of these springs may be gathered from the fact that eggs can be nicely boiled in this water in from three to five minutes.



STEAM COMING FROM CAVES.



ORNITHOLOGY

All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor.

A Friend of the Birds.

OUR VISIT TO THE GLOUCESTER HERMIT.

It is now more than thirty-one years since Mason A. Walton came to the rocky shores of Cape Ann and pitched his tent on a high promontory overlooking the Gloucester harbor. This site, which he called "The Eyrie," was on the outskirts of the settlement and near the edge of the twelve-thousand acre tract of woodland which then comprised the western part of the city of Gloucester, Massachusetts. Since that time Mr. Walton has lived the life of a hermit, and has become widely known through maga-

zine writings and his book entitled "A Hermit's Wild Friends."

His present cabin is not far removed from "The Eyrie," although it is snugly sheltered among the pines, while about the dooryard and upon the trees nearby are numerous boxes and feeding devices for the shelter and accommodation of his "wild friends," the birds and squirrels.

One cold winter's day—the third of March, 1916—while the ground was deeply covered with snow, we made a visit to this little cabin in the woods, finding it a walk of about three-quarters of a mile from Western Avenue, on the old, abandoned Salem Road. As we approached the cabin we noticed a dozen or more chickadees, a tree sparrow and a small flock of juncos feeding about in front of the entrance.

We were cordially received by Mr. Walton, who talked freely of his expe-



THE HERMIT'S CABIN "SNUGLY SHELTERED AMONG THE PINES."



"SHOWED THEIR CONFIDENCE.....FEEDING FROM HIS HAND."

riences among the birds of the vicinity, and gave some interesting anecdotes in connection with his observations of their habits. He stated that "Wabbles," a cer-

cabin, he opened the door; placed a table near the entrance, within the room, and sprinkling upon it a handful of hempseed, called to the chickadees, which almost immediately responded. They alighted readily upon the table and carried off the hemp, taking sometimes one and sometimes two of the large seeds in their little bills. There was usually but one bird on the table at a time, while the others



CHICKADEES IN THE HERMIT'S CABIN.

tain song sparrow mentioned in his book, which he found in his dooryard more than twenty-five years ago, was still alive and about his old haunts during the past season.

While we ate our lunch in the hermit's



WAITING FOR AN INVITATION.

waited just outside the door, although one of these would frequently dart in and drive away the feeding bird, usurping its place at the seed. On several occasions we noted two, and in one instance three, of these birds within the cabin at the same time, and they seemed not at all alarmed or disturbed by our presence a few feet away.

Mr. Walton then sat upon the edge of his chair near the open door, and holding out some seed, again called to the chickadees, a number of which showed their confidence by alighting upon and feeding from his hand. Several others and a tree sparrow were meanwhile busy at a doughnut and other food just outside upon the ground, while a number were also feeding upon the pieces of suet suspended from a long pole between two trees in the dooryard.

When the hermit first came to Gloucester he was in exceedingly poor health, but has been completely restored by his life in the woods, and is now hale and hearty. He is a man of education and considerable experience, and a firm believer in animal intelligence. While ornithologists generally do not agree with Mr. Walton in many of his views, his long life among the wild creatures must be considered and he may have seen many unusual incidents pertaining to their lives not elsewhere recorded. We have found his book delightful reading and would recommend it to all interested in wild life.

These bird friends, with others in their season, bring a great deal of pleasure to the hermit in his solitary cabin, and our trip was a happy reminder of the remarkable confidence which may be won from our feathered guests, with kindly treatment and a little effort to attract them by offering food and shelter.

Wren's Nest Built of Wire.

Mr. Henry F. Norcross, of Bridgeport Connecticut, writes of a nest of a house wren, which was built in a tomato can attached to a tree on the farm of Mr. Wells W. Lewis of Munroe, and composed entirely of wire. Clarence Andrews, the lad who made the nesting box, which was covered with birch bark, knew nothing of its contents until the matter was called to his attention. For some unknown reason the nest was apparently deserted when it contained but one egg.

and while it was preserved for awhile, it was unfortunately destroyed by mistake before it could be sent to this department to be inspected and photographed. A short piece of rusty, twisted wire, about the size of that used for paper clips was sent us as a sample of the nesting material. The nest is described as rough and scraggly, with little or no attempt at weaving the material together, but concave sufficiently to hold the eggs. This is indeed a curious nest, and the reason for using such material seems one of those vagaries of bird life for which we cannot account.

Brush Hill Bird Club Report.

The first report of the Brush Hill Bird Club of Milton, Massachusetts, describes a very complete exhibit held by that club in the public library and should be found useful to other organizations contemplating such exhibits. Much valuable information is also given regarding state and federal laws relating to the birds, a map of the state bird reservations, and numerous lists and references of value.

This report contains one hundred and twenty-three pages and several half-tone illustrations and should be of interest to bird-lovers generally, especially those having to do with the organization of bird clubs.

A few copies may still be obtained by application to the general manager, Dr. Harris Kennedy, Readville, Massachusetts, at fifty cents per copy.—H. G. H.

"The Bluebird," formerly published by Eugene Swope, is now issued under the auspices of The Cleveland Bird Lovers association, with Mrs. Elizabeth C. T. Miller of Cleveland, Ohio, as owner and editor. Interesting articles by Dr. R. W. Shufeldt of Washington, T. Gilbert Pierson and Winthrop Packard of the National Association of Audobon Societies and others make up an attractive number of this little magazine for January.

Twenty-eight species of birds are known to feed upon the cotton boll weevil, which destroys such an immense amount every year in our southern agriculture. This is only one instance of the great value of birds in economics, and the more they are studied the more useful they are found to be.

Is It Unwise to Feed the Birds?

BY THE REVEREND MANLEY B. TOWNSEND,
SECRETARY AUDUBON SOCIETY OF NEW
HAMPSHIRE, NASHUA, NEW HAMPSHIRE

Frequently someone with more zeal than knowledge denounces the winter feeding of the birds as unnecessary and economically unwise. Such an attitude is a good illustration of the old saying,



"THERE WAS A LITTLE DOWNY WOODPECKER
AT HIS THANKSGIVING DINNER."

Photograph by Mr. Harry G. Higbee.

"A little knowledge is a dangerous thing." The latest manifesto along this line is by a Kansas professor, who declares that feeding the birds has a tendency to diminish their usefulness as destroyers of insect eggs, pupae and hibernating adults, as it removes the necessity that is supposed to keep the birds hustling. It would seem that there might be something in this reasoning, but what are the facts? Birds prefer their natural food. Where they can get that in sufficient quantities they do not care for food that we give them. This is proved conclusively by the fact that only winter feeding proves successful. When spring comes, the birds leave our food, no matter how attractive it may be. Only dire necessity drives them to our feeding stations.

During the winter many birds have difficulty in finding sufficient food. Search as they may, the natural supply is inadequate. The spark of life burns low and, alas! too often flickers out. With a full stomach a bird can bid defiance to any weather. With fuel under the boiler, sufficient steam is

generated to keep the machinery running. Food placed out for the birds may save many a little life by providing just the necessary additional fuel needed to keep up the steam. The first sharp edge of hunger blunted, the bird will pay for his dinner by searching the trees in the vicinity and destroying all the insects that he can find, for he always prefers his natural food. It pays, in dollars and cents, to feed the birds. Every orchard should at regular intervals have suet fastened to the trees, as well as bird boxes for nesting purposes.

There is pleasure in watching the feeding birds—their beautiful colors, their graceful movements, their engaging ways, to say nothing of gaining their confidence and perhaps persuading them to light upon us and take food from our hands. There is a joy in such companionship, a deep satisfaction in ministering to a dependent life.

On Thanksgiving Day, as I sat down to dinner, I glanced out of the window into the apple tree. There was a little downy woodpecker at his Thanksgiving dinner of suet (we both had suet pudding that day) and my heart was the lighter and my Thanksgiving the brighter because I had a tiny feathered guest to enjoy my bounty. Try it for yourself and see if this is not so.

The Birds of Connecticut.

Bulletin 20 of the State Geological and Natural History Survey, issued by the State Library at Hartford, and entitled "The Birds of Connecticut," is a three hundred and seventy page book by John H. Sage, Secretary of the American Ornithologists Union, Dr. Louis B. Bishop, and Walter P. Bliss, M. A. An annotated list of the appearance of the birds makes up the first part of the volume, the second part being devoted to economic ornithology under the editorship of Dr. Bishop. There is also a valuable bibliography in connection with the work.—H. G. H.

A new study by the Danish naturalist, H. Blegvad, shows that the chief food of the creatures that live on the sea floor is the fragments of dead or dying animals and plants that drop down on them from above. Next to this in importance come the growing plants of the ocean.

An Unusual Set of Eggs of the Least Tern.

BY DR. R. W. SHUFELDT, WASHINGTON, D. C.

Not long ago in going over the celebrated collection of North American and Australian birds' eggs belonging to Mr. E. J. Court, of Washington, D. C., the owner called my attention to a remark-

the one in the upper left hand corner is the same egg as the one in the lower left hand corner—and so on for the middle and the last one in the row. The markings on one side of any one of these eggs three in the upper row are repeated in the same sequence in the lower row, so that as they are shown in the upper row are by no means abundant; but when we



AN UNUSUAL SET OF EGGS OF THE LEAST TERN.

able set of eggs of the Least Tern, and very generously loaned me the clutch for the purpose of photography and description.

Mr. Court collected this set himself on the sixth of June, 1914, at Deep Point, St. George's Island, Maryland. There was no nest, and the full complement of eggs was three, as shown in my photograph illustrating the present article. At the time he was there, a colony of seventy-five pairs of these birds was breeding on the same area, which is a part of Maryland I have never personally visited.

These eggs are of a pale creamy white, with markings, as shown in the cut, of blackish brown—almost black in some places; there are also scattered spots of pale drab or gray. My photograph shows each of these eggs on two views. The

come to turn the eggs over it will be observed that each and all of them exhibit a big blotch on the reverse side, and of a pattern shown in the illustration.

Perhaps the most extraordinary appearing egg of this set is the one in the middle of the two rows. On one side it exhibits but a few and small scattered spots as markings, while on its other side these spots are still smaller, but to these we find added a great, square, central patch of a deep blackish brown, which gives the egg a very extraordinary appearance.

I will be interested to know whether any other collector of birds' eggs in this country has ever come across a set of the Least Tern's eggs in any way approaching this one in the matter of peculiar markings; if so, I should very much like to hear of it.

Bird Movies.

Mr. Herbert K. Job, of New Haven, Connecticut, Ornithologist of the National Association of Audubon Societies, spoke February 24 at the McNiley Manual Training School at Washington, D. C., under the auspices of the Audubon Society of the District of Columbia, and showed four reels of motion pictures taken by himself portraying wonderful scenes of wild bird life.

United States Senator George P. McLean, of Connecticut and his Secretary, W. H. Sault, were in the audience and the Senator was enabled to see himself as others see him. In other words, he was in the pictures as a "Movie Star."

One reel of the pictures was of wild ducks and geese on the great wild life refuge of Louisiana taken on a trip early this winter in which Senator McLean was a party. Their present abundance is largely due to the McLean Federal Law protecting migratory birds, of which Senator McLean was the author and father. Mr. Job and Mr. Pearson, Secretary of the National Audubon Societies, invited him to go on this trip to see for himself the results of his law.

These preserves include some 335,000 acres extending over 75 miles of coast line and wild ducks and geese by scores of thousands spend the winter in security here. The policy of establishing these reservations was begun by the National Audubon Society, and the McLean Law comes in as a mighty ally for the success of the whole movement. These Audubon films are to be shown all over the country by arrangement with the various film companies to promote the work of the Audubon Societies, and to interest the public in wild birds and game and their proper conservation.

The Domestic Cat.

ECONOMIC BIOLOGY—BULLETIN NO. 2.

An exhaustive report with the above title has just been issued by the Massachusetts State Board of Agriculture, under the direction of Edward Howe Forbush, State Ornithologist. It contains a history of the cat from its earliest known records; its usefulness to man and place in the home; its economic value in suppressing noxious rodents and its importance as a destroyer of useful birds in this and other countries, with some

suggestions as to its proper control.

As a summary of the immense amount of material gathered from wide sources in the preparation of this report some very significant facts are brought out regarding the bird-catching habits of cats, and it would seem high time that some legal preventive measures were taken in this matter.

This bulletin, which contains one hundred and twelve pages and is well illustrated, should be in the hands of not only every lover of birds but every owner of cats.—H. G. H.

A Snowbird Enjoyed a Visit within a Home.

Flemington, New Jersey.

To the Editor:

Monday night, a bird which I do not identify, but which we call, together with several others, snowbirds (juncos) wanted to get in the house. He tried for an hour or more and finally I let him in. He seemed to be perfectly at home in the house and next morning I let him out. Is not this unusual?

Yours truly,

HIRAM E. DEATS.

* * * * *

I have never personally known of such an instance. Perhaps some of our readers have had a similar experience. Birds seek all sorts of places for shelter in severe weather and under certain conditions, but not knowing either in this instance, we can give no light on the subject.—H. G. H.

One should sleep alone. Then the body is equally warmed and equally exposed on all sides. To sleep next to another person, the body is unduly warmed on one side, while it is exposed on the other side, which slightly deranges the action of the entire nervous system.—"The Columbus Medical Journal," Columbus, Ohio.

We are apt to think of the crinoids, or sea lilies, only as fossil creatures. A recent monograph of the United States National Museum, however, shows that they are by no means uncommon on the floor of modern oceans. In fact, the world over, they are about as abundant, both in species and individuals, as are their near relatives the starfish and the sea urchins.

TO KNOW THE STARRY HEAVENS

THE HEAVENS IN APRIL.

Two New Comets. How Comets Are Captured. The April Shooting Stars. Mars Still In Excellent Position for Observation.

BY PROFESSOR ERIC DOOLITTLE OF THE
UNIVERSITY OF PENNSYLVANIA.

The most striking of our evening constellations is now the beautiful group, Leo, which shines almost exactly on the meridian in the south.

stretches two-thirds of the way across the southern heavens, bearing the Cup and the Crow on its back.

The observer who is familiar with the brighter constellations will find it most interesting to trace out the Lesser Lion, which is made up of all the faint stars lying between Leo and the paws of the Bear, at E and F, Figure 1. And to the west of this he will find the equally faint Lynx, a quite extended group including all stars from Leo Minor to the region H,



Figure 1. The Constellations at 9 P. M., April 1. (If facing south, hold the map upright. If facing east, hold East below. If facing west, hold West below. If facing north, hold the map inverted).

Above this, we find the whole region about the zenith covered by the Great Bear which has now attained its highest position in the heavens, while below Leo the very long Water Snake

Figure 1. This constellation is quite remarkable for the large number of double stars which it contains; there are no less than fifty of these which are visible in a quite small telescope.

The star at K, for example, is made up of two beautiful suns, three seconds apart, of which the larger is greenish-white and the fainter one blue. A somewhat similar beautiful double pair is in Leo at L, while the brilliant Regulus has a deep blue companion, one minute away, which is itself a double

* * * * *

The April Stars.

To the east of Leo, there is the very large summer group Virgo, which for the first time this year is seen to have completely entered the evening sky. The beautiful Spica is the most striking object of this constellation. This remarkable star is now known to be revolving about a dark and unseen companion with a speed of fifty-six miles a second. It thus passes completely around its orbit, which is six millions of miles in diameter, in the course of only four days. The system is very like that of the well-known Algol, at M, Figure 1, but the path of Spica lies in such a position that we never see the dark companion pass between the bright star and us, and so cut off its light, as so frequently happens with Algol. It is in the region, N, of this constellation that there are found more of these wonderful shining clouds called Nebulas than in any other equal area of the sky.

North of Virgo the observer will at once notice the great golden star, Arcturus. This is at the foot of Bootes, the Driver, who with upstretched arms is forever driving the Bear before him in its ceaseless journey around the Pole. And below Bootes is the beautiful Northern Crown, while still nearer the ground there has now fully appeared the group Hercules, with its wonderful cluster of sixty thousand stars, at R. In short, the whole southern and eastern heavens are so crowded with objects of interest, that we need not regret the withdrawal of the brighter winter stars, which is now proceeding so rapidly in the west.

* * * * *

A New Periodic Comet.

There are two new comets in our northern heavens, both of which are extremely faint objects and only visible in larger telescopes. Nevertheless the first of these is of great interest because it has been found to be following

so very small an orbit around the sun that it is destined to continually reappear in our heavens in the years to come. Many most interesting speculations arise from a study of these periodic comets, especially when they move in paths so small that they may

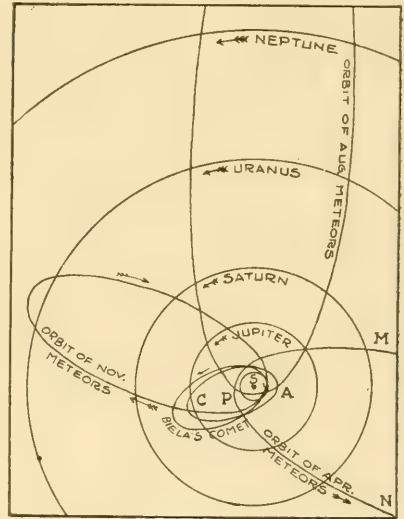


Figure 2. The path of the new comet about the sun.

be observed from the earth during a great part of their motion.

The path of the new periodic comet is shown in Figure 1. It was discovered at the Cape of Good Hope on last December 2, at which time it was very near the western end of the Belt of Orion. Its apparent motion carried it, first through Taurus, and then into Gemini; during the present month it will move from the latter constellation into the faint group of stars known as the Lynx.

When a new comet is thus found moving among the stars, it is only necessary to determine accurately its position on three different nights; knowing these three positions the mathematician can compute its exact path in space and tell where it was to be found in the heavens at any desired date, either in the past or in the future. Nearly all comets fall toward our sun from an immense distance away, swing around that body, and recede into space never to be seen by us again. The paths of such comets is a curve called a parabola, which closely resembles the curve MPN, Figure 2.

The long computation necessary to find how a comet is moving is much shortened if we assume in the begin-

ning that its path is a curve of this kind. Continued observations on the present comet soon showed, however, that its motion could by no means be accounted for on the assumption of such an infinite path. A complete computation soon revealed that its orbit is a very small and narrow ellipse, AC, extending from beyond the earth's

later planetary disturbances have since altered this path to the position BC.

Computation shows that the new comet passed close to Jupiter in 1913. The pull upon it by the Giant Planet at this time must have very greatly altered its path, changing it into the new, small orbit along which it is moving now. Whether before this disturb-

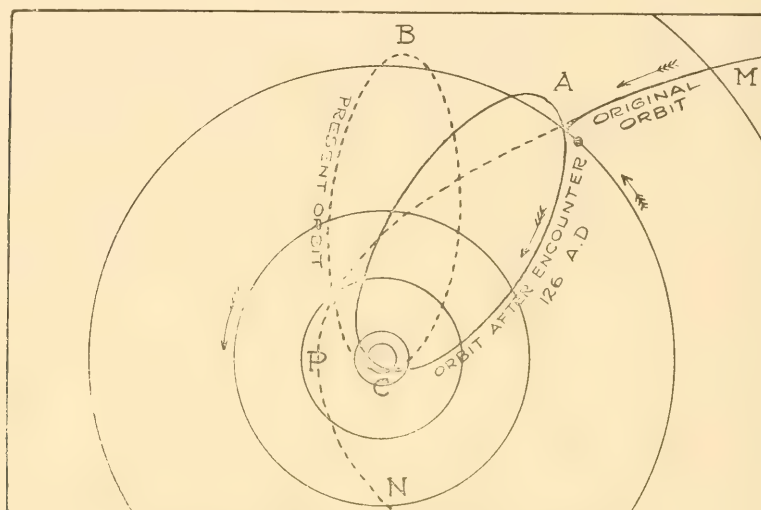


Figure 3. Showing how a comet may be "captured."

orbit to a very slight distance beyond the orbit of Jupiter. The comet passes completely around this path every six years; it was nearest the sun on last January 30; and is now rapidly drawing away from the earth.

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How the New Comet Was Captured.

A comet is a great nebulous cloud, composed of meteoric matter, gases, and cosmic dust, which falls toward our sun from the depths of space. It is therefore a visitor, and it can visit us only once unless it is disturbed in its motion. If, however, it happens to pass sufficiently near one of the planets, the gravitational pull of this body may completely alter its path, and may either send it out of our Solar System faster than it entered, or it may cause it to move in a closed orbit and thus prevent its ever leaving us again. Thus, when Tuttle's Comet first fell toward the sun, along the path MPN, Figure 3, it passed so near to Uranus that the disturbing pull of this planet caused it to follow the path AC, and

ance its path was a parabola, so that it entered our system only three years ago, or whether it is merely one of the older periodic comets whose path has thus been changed, we do not yet know. Further computations will undoubtedly, however, soon settle this point.

The continued observation of these periodic comets at their successive returns is of the highest interest and value. In at least one case, that of Encke's Comet, the motion was found to be disturbed along part of its orbit, a disturbance which cannot be due to the pull of any known body in our Solar System.

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The April Shooting Stars.

This is one of the few conspicuous showers of the year, and though not so well known or so numerous in stars as those of August and November, it is still a most interesting phenomenon for the naked eye observer. It should be looked for on the nights from April 20 to 22, and if possible at a late hour

of the evening; it cannot, indeed, be seen to the best advantage until after midnight.

If the observer will face the northeast and patiently watch the region of the sky near the constellation Lyra, he will at intervals see a white, swiftly moving star dart outward from near the point D, Figure 1, and move in any direction across the sky. The later the hour of the night the higher this region will have risen from the ground, and the more satisfactory the observation will be. It is unfortunate that on these dates the moon will be shining in the eastern heavens and that it is but little past full. This will make the observation of the fainter shooting stars of the shower difficult or even impossible.

This shower of so-called shooting "stars" is caused by the passing of our earth through a great stream of meteoric particles which are moving around the sun in the path MPN, Figure 2. This is the path followed by the comet of 1861. The great stream is probably only the remains of this comet, which has been stretched out along its path by the tidal action of the sun.

Very probably this same action is gradually destroying all periodic comets, or rather, it is changing them from compact clouds into long streams of material. It may be mentioned, however, that when the new comet is thus drawn out along its path it will give rise to no additional shower, for our earth does not pass through the orbit of this comet. The orbit, (AC, Figure 2) is inclined to the plane of the orbit of the earth by an angle of more than fifteen degrees.

The Planets in April.

Mercury cannot be observed during the present month. At the beginning of April it is in the morning sky, and though it passes to the east of the sun on April 14, it will not reach its greatest distance and so emerge from the sun's rays until May 12.

Venus, the most beautiful and conspicuous object now in the heavens, cannot fail throughout the present month to attract the attention of every observer. It will attain its greatest distance east of the sun on April 24, and though a most brilliant object then, it will continue to grow brighter until May 27. In the telescope the

planet is now seen to be very slightly more than half full.

The path of Venus among the stars during the coming months is shown in Figure 1. While on the whole it moves eastward among the stars, an interesting fold occurs in the path during June. On account of this, Venus, will pass Saturn three times; namely, on May 23, June 22, and September 6. The first and last of these will be interesting conjunctions, at the time of the second one the planets will be too nearly lost in the sun's rays to be observed with advantage.

Mars is still in excellent position for observation, but it is steadily receding from the earth. Its distance from us will increase from eighty-six millions to one hundred and ten millions of miles during the present month, and it will therefore appear to grow continually smaller and fainter. The polar caps and larger markings, can, however, still be well seen.

Jupiter enters the morning sky on April 1, and throughout the month remains too near the sun to be well observed.

Saturn is near the center of the constellation Gemini, in excellent position for observation.

That our weeds and wild plants are so largely foreign species is said to be the reason that this part of the American continent was formerly forest-clad. The old plants, therefore, do not flourish in the present day conditions, and their place is taken by European plants from unforested districts.

They'll come again to the apple tree,

Robin and all the rest,

When the orchard branches are fair to see

In the snow of the blossoms dressed;

And the prettiest thing in the world will be

The building of the nest.

—Margaret E. Sangster.

Redbud.

Pink fairies are peopling the sweet April woods.

They flit in and out 'mong the trees;

Or so it would seem as we'er motoring by,

And surprise them in sunlight and breeze.

They are holding high carnival now while they may,

Awaiting their fair woodland queen,

Who soon will be reigning in billowy white

In the fresh forest fastnesses green.

—Emma Peirce.



EDITORIAL



Let Us Be Thorough.

Our readers will recall that delightful story ("Great Expectations") by Dickens, in which Joe and Pip engage in the delights of correspondence. Pip, sitting in the chimney corner with his slate, expended much effort on a letter to Joe in the opposite corner. He had an alphabet on the hearth at his feet for reference, and after laboring for an hour or two he printed an epistle of about four lines in which "caps" and "small caps" were delightfully and impartially mingled. Pip delivered the slate to Joe, who received it, Dickens tells us, "as a miracle of erudition." Then occurred the following dialogue:

"'I say, Pip, old chap!' cried Joe, opening his blue eyes wide, 'what a scholar you are! Ain't you?'"

"'I should like to be,' said I, glancing at the slate as he held it: with a misgiving that the writing was rather hilly."

"'Why, here's a J,' said Joe, 'and a O equal to anything! Here's a J and a O, Pip, and a J-O, Joe.'"

"'I had never heard Joe read aloud to any greater extent than this monosyllable, and I had observed at church last Sunday, when I accidentally held our Prayer-book upside down, that it seemed to suit his convenience quite as well as if it had been all right. Wishing to embrace the present occasion of finding out whether in teaching Joe, I should have to begin quite at the beginning, I said, 'Ah! But read the rest, Joe.'"

"'The rest, eh, Pip?' said Joe, looking at it with a slowly searching eye. 'One, two, three. Why, here's three Js, and three Os, and three J-O, Joes, in it, Pip!'"

"'I leaned over Joe, and, with the aid of my forefinger, read him the whole letter."

"'Astonishing!' said Joe, when I had finished. 'You ARE a scho'ar.'"

"'How do you spell Gargery, Joe?' I asked him, with a modest patronage."

"'I don't spell it at all,' said Joe."

"'But supposing you did?'"

"'It *can't* be supposed,' said Joe. 'Tho' I'm uncommon fond of reading, too.'"

"'Are you, Joe?'"

"'On-common. Give me,' said Joe, 'a good book, or a good newspaper, and sit me down afore a good fire, and I ask no better. Lord!' he continued, after rubbing his knees a little, 'when you *do* come to a J and a O, and says you, "Here, at last, is a J-O, Joe," how interesting reading is!'"

* * * * *

What would one say if literature were taught in our schools only to that extent? What kind of appreciation would there be in the present deluge of books and magazines, if we were to go no further in our reading than to say, "J-O, Joe, how interesting reading is!" Yet the painful part is, that Joe's method of reading is not altogether a paraphrase; it is too often a sad reality.

Some modern methods of reading nature, are on a parity with Joe's method of reading Pip's letter. We have trouble in interesting people generally in nature, because the subject in general, notwithstanding the earnest efforts of some members of our Association, is not properly understood. We find, from remarks made by visitors at ARCADIA, that the true method of studying nature is not understood in the slightest degree nor even dreamed of. We do not believe, and do not teach, that everyone must spend, as I have known a student to spend years in studying earthworms, and half a dozen years in studying a bumblebee cut into thin slices. It is necessary to progress beyond Joe's stage in the art of reading to become a technical student of comparative literature; but to take an enjoyable interest in nature, it is not necessary for everyone to become a technical scientist. Yet nature should be read by everybody, extendedly, thoroughly and as enthusiastically as one may take delight in reading general literature, or current books and magazines.

A short time ago a cultured person asked two or three simple questions that had nothing to do with nature study, but with the method of caring for an aquarium. These were answered, when the

inquirer drew a long breath of relief and said, "Oh, my, you must have to know a big lot to run an Institution of this kind. It almost makes my head ache to think what a lot of study must be needed!"

I have several times visited schools, where I have been told in advance that I would go into ecstasies over the delightful teaching of nature study there pursued by a thoroughly skilled instructor. I have found many teachers that met my expectations, though even heightened by the advance eulogy, but in some I have been, alas, sadly disappointed. What do I usually find? A fruit jar, with about an inch and a half of water in it, a little sand, a spray of a green plant, and two sickly tadpoles. On the wall, near the teacher's desk, may be pinned one cocoon, probably of the *Cecropia*, and one butterfly, usually the monarch.

Not a long time ago I found in a school-room a "Collection"—I am spelling this with a capital to do justice to the pride with which the word was spoken—that consisted, by actual inventory, of one hornet's nest, seven pieces of minerals, and one piece of wood with a fungous growth upon it. When I was told that this was the result of the children's work during one season, I thought of Pip and poor Joe Gargery:

"When one spells J-O, Joe, how interesting reading is!"

We are told in the recent lamented dissension between Mr. Seton and the Boy Scouts, that that organization manifests not enough outdoor interest but too much militarism. We need not enter into the controversy further than to say that the Scouts certainly do not have enough of reading in the book of nature. It is claimed that there is an astronomical requirement, and a few others connected with outdoor life, but they bring to mind Joe's assertion. A similar criticism may be made of the Camp Fire Girls, an association that by its very name connotes an outdoor organization. The re-organized order of the Woodcraft Indians I sincerely hope will demand more in their astronomical requirements than the mere ability to recognize the Great Dipper and Polaris. Ye gods! Think of that! An organization for the living of an outdoor life required to know what even a child is supposed to know—the Great Dipper, and the pivotal point of the celestial sphere! We feel sure that that requirement will be changed for the better in the

near future. As it is, the requirement should be recorded in two paragraphs and so worded that J will begin the first, and O the second.

Recently two girls called at our office and requested permission to go into the Agassiz Grove. I found that the call was to meet a school requirement to observe four, or possibly six, birds. I said, 'Come out here. We can get those birds 'right off the bat'—chickens, ducks, English sparrows and starlings. You may see plenty of them out of the back door. If you want to take a postgraduate course in order to become thoroughly erudite in this interesting ornithological reading, look yonder; spend a moment in the brain-racking process of watching that crow above the golf grounds, and that downy woodpecker eating suet. There you have it—the whole requirement."

Every member realizes that there is nothing superficial in The Agassiz Association. We believe that the book of nature is interesting reading, and that it is worth while to go beyond the rudiments. J-O, Joe, may be interesting reading, but do not forget that Joe must be followed and completed by a family name.

Recently our Glenbrook Chapter spent an evening in The Welcome Reception Room. I walked with them from the room to the trolley car, and while en route we learned to recognize the following, so that every boy can now point them out, and I am sure, will remember them: Orion, Taurus, Gemini, Ursa Major, Ursa Minor, and Perseus. At the time, three planets were conspicuous in the heavens; it took us about half a minute to memorize Jupiter, nearly west; Saturn, nearly south; and Mars, nearly east. We also learned in that short walk to the trolley car the position and appearance of several stars: Sirius, Procyon, Aldebaran, Castor, Pollux and that great requirement, Polaris.

This lesson was really learned by those enthusiastic boys; the time taken for the whole course was not more than ten minutes as we sauntered along the road, stopping now and then to look upward. Everyone enjoyed that walk; not one said, "You must know a big lot. It makes my head ache to hear all those different things." To learn such things is not more difficult than to learn that the names of the vivacious girls whom you meet are Jane, Sue, Sally and Phoebe, or boys whose names are John, James, Phillip

and Sam. "Whew! Tell me eight names all at once. My, but you must know a big lot to know so many people. It makes my head ache just to think of it."

If you believe this statement is overdrawn, come in the Sound Beach Observatory and listen to the difficulty in teaching a lesson on the four very conspicuous satellites of Jupiter: Io, Europa, Gannymede and Callisto. I wish they had been named Jane, Sue, Sally and Phoebe!

It is astonishing how many people are prevented from having a "speaking acquaintance" with *all* the constellations and most of the principal stars, because the mental effort is regarded as a great burden instead of a simple little pleasure.

You meet two red-headed girls and are told that one is Dolly, the other, Dorothy. Do you then look frightened and say: "They both have red hair, and their names are so much alike. How can I distinguish the one from the other?"

Shining almost due south are the two dog stars, one the big dog, Sirius, and the other, the little dog, Procyon, and yet you say, "You must know a big lot if you know those stars apart. They are both dogs aren't they? How can you remember which is which?"

Suppose you meet two boys. One is John, the other is James; both have freckled faces and are of about the same size and height. Would any person of common sense say, "You must know a big lot to be able to distinguish one boy from the other?" Then why do you say, "There is Cepheus, and there is Perseus, both kings, are they not? How do you know which is which—no, I mean they are not very far apart in the sky."

It is a common impression that a study of nature is uncanny, and deals with the supernatural, with things not in touch with our everyday life. Recently our stenographer, sitting near an open window in the office, overheard this conversation: "That is ARCADIA. I want to go in there sometime."

The reply in awe-stricken tones was, "Don't you dare do it. I wouldn't go in for anything in all the world. They have a lot of dead things in there."

After all, what is natural science? Is it not, as Huxley said, merely organized common sense? What we want among the students of nature everywhere is not only a few friends but many; not only a few speaking acquaintances with whom these friends are on friendly terms, but

"lots" of them. So read widely and attentively. Cultivate an acquaintance, in a common sense manner, with the friendly constellations, the single stars, the planets, the trees, the birds, the butterflies; with moths, minerals, frogs and grasshoppers, but do not, Oh, I beg of you, spend a whole evening and laboriously work over evolving four lines of hieroglyphics and then pass that on to an admiring friend who will say, "Oh, my, what a lot of nature study you have! Why you really have a tadpole and a butterfly, one constellation, and Polaris, also."

"J-O, Joe; how interesting reading is."

A Plea for the Scientific Study of the Sciences.

At a meeting of the Pennsylvania State Science Teachers' Association, at Harrisburg, Prof. H. A. Surface, State Zoologist, made a strong and logical plea for scientific study of the sciences. He spoke extemporaneously and practically as follows:

I have in mind to call the attention of the science teachers of this State to the real status and importance of the sciences versus nature study, agriculture, or any of the arts based upon the sciences. A decided movement is now on foot to introduce agriculture into the schools. This leads us to analyze the situation and ask "What is agriculture?" It is not "*a science*," but is the practical application of the teachings of several sciences. Therefore, it is an art. The study of the sciences upon which agriculture is based should be preliminary to the study of agriculture, and while we hope to see the time when agriculture will be taught in the schools, yet we trust that will not be until arrangements are made to have the pupils first study the fundamental sciences of physics, chemistry, geology and biology.

There is not one fact in the entire realm of agriculture that is not founded upon the principles of some of the sciences, and the rational teaching of the sciences would not only fit the learner for an agricultural pursuit, but also for other professions in which a knowledge of the sciences is needed. To study agriculture means to study the application of those fragments of sciences which converge in the art of agriculture, or the application of those principals of the sciences which per-

tain to soil productivity and plant and animal propagation, and the student is thus limited.

Agriculture is a grand and complex subject, involving the applied knowledge of some features of physics, chemistry, astronomy, meteorology, mineralogy, general geology, physiography, physical geography, botany, zoology (including, of course, entomology), evolution, anatomy, physiology and hygiene. If the chief of these subjects were taught rationally based upon their relationship to human needs, and the practical application of their teaching emphasized, the student would be able to make use of his knowledge, not only in agriculture, but in any field toward which he might wish to turn. Thus a student of the sciences is broadened: he is equipped with a means at once of reaching farther than is permitted within the narrow scope of the practical applications that comprise only one line of human activity.

The chief value of the sciences lies in the development of a great plan of classification in relationship, as shown in Nature and called Taxonomy. When systematic botany is taught as such the pupil at once sees the relationship of plants, as expressed in orders, families, genera, species, and subspecies. The same is true in the study of other natural sciences, and even in the inorganic sciences. In astronomy the relationship of planets is so definite that some were discovered in searching for them in the place where exact mathematical calculation showed they should be found. In chemistry certain rare elements have been discovered only long after it was well known, by their respective places in natural classification, that such should exist, and there are places now known for others yet to be discovered. It means a great deal for the learner to take up a systematic science and be made properly aware of such facts. In not other study than in systematic science can the beauties of these subjects be thus emphasized.

In teaching the sciences we teach the entire structural plan of the subject as a unit, and thus in studying the fundamental classification expressed within a subject, one obtains a bird's-eye view of it as a whole. In studying more minutely the different branches of a science he sees the relationship of its

different parts to one another, and of this particular science to others. This view is not to be obtained in any other way than through a rational scientific study of the sciences. This does not mean that the economic features of the subject should be lost, but rather, that by rational teaching those principles which are of economic value can be emphasized; but other principles, which are today not considered of great value, may also be taught, and their value may be discovered and used at some time in the future.

A person who has studied the sciences properly and rationally is equipped to go into practical agriculture and understand for himself the relationship of the new complexities which he may meet. He is not only equipped for this, but also prepared to take up the several other arts which are based more or less upon the sciences which he has studied; while the one who has studied agriculture only, is equipped to take up but this one art, or closely related subjects, and he is trained to follow only in the routine in which he has been taught. He has not learned the broad relationship of the sciences comprising the art, and naturally he is unqualified to make use of their application to other subjects.

If the admission of nature study and agriculture in the schools is to mean the crowding out of the fundamental sciences, such as physics, chemistry, botany, zoology and geology, we as science teachers are justified in looking upon it with alarm. It is our duty, as persons particularly trained in these subjects, to see that they have proper inspiration and reception in our schools. If we teach them fairly and emphasize at proper places their practical teachings, there would be no need of the introduction of those subjects that are fragmentarily based upon such sciences until after the pupils are qualified to take them up as advanced subjects, rather than to reverse the natural sequence, and attempt to make them the means of entering into a study of the practical fields of human activity.

Nature study has its place as a means of interesting very young pupils in the world of Nature about them, and it also has its proper educational value as the basis of much other work, such as drawing and language. Pupils certainly pre-

fer to draw the things they see commonly about them, and they can talk or write best of the things of which they know most. But the purposes and methods of nature study must not be confused with those of science. Neither is nature study agricultural even in its elementary form. When the pupil reaches an age that he is to study agriculture, he can better understand it by having been taught rationally and plainly some of the fundamental principles of the sciences which are recognized as its foundations.

My plea then is, not so much against nature study and agriculture, as for the sciences first. These can be taught as elementary as may be desired, and in properly teaching them we are giving instructions not only in agriculture, but also in dozens of other arts or practical fields in which the pupils thus become prepared later in life, if they wish.

Summer Sessions for Delight.

Two superior courses are offered students of marine biology—one by the old and extensive laboratory at Woods Hole, Massachusetts; the other by a younger but as efficient laboratory at Cold Spring Harbor, Long Island. The laboratory at Woods Hole will soon hold its twenty-ninth session, while the one at Cold Spring Harbor will soon hold its twenty-seventh. For particulars and circulars, address the laboratories at the addresses given. Full particulars will be sent in an attractive pamphlet.

These laboratories are great American factors in promoting an interest in biology. The editor has enjoyed a session at each laboratory, and knows that the facilities are unexcelled, the instruction pleasing and efficient, and the surroundings ideal for a vacation at the seashore.

We have among our readers a number of cultured and educated people who do not realize that either of these laboratories is especially adapted to them. Perhaps they think of them as something for the college professor or special student, something to supply credits toward a learned degree. They are that, but they are more. They are thoroughly, enjoyable places for using one's brains at the seashore, as well as in having good food, good bathing and the sight of picturesque seaside surroundings.

We number among our readers many who are accustomed to spend their summer at fashionable hotels at various re-

sorts. Many of these are genuine nature lovers. It has perhaps not occurred to them that here is an opportunity to have nature study that is worth while and under competent supervision. If you are tired of the trite round of ordinary activities at the fashionable seaside hotel, try at least one session at one of these laboratories. You will find it a delight of your life.

To teachers and students of biology, the editor need say nothing. These laboratories are known to all of them as the *ne plus ultra* of a summer vacation.

What is Beauty?

Beauty and goodness are to be found everywhere when we forget and overlook the ugly and the bad. There is nothing in all the world that has not some beauty and goodness. This would be a suburb of heaven if people would stop making it the opposite.

These thoughts came to mind as the result of a little experience that I had a few evenings ago with four cultured ladies from Greenwich. They had telephoned for special appointment at the Astronomical Observatory. I therefore had planned to show them the best at my disposal.

I first turned the telescope upon Saturn. Their enthusiastic words were gratifying. Then we tried the Orion Nebula. They did not know that there was such a beautiful thing in all the heavens. That too gratified me. After seeing the "Jewel Boxes" of Perseus, they seemed eager to use all the commendatory words in the dictionary. Their enthusiasm knew no bounds. As the climax and the closing event of the astronomical exhibit, I tried Castor. It seemed to be a new idea that a star can be two in one, and I do not know when visitors have been so pleasingly and appreciatively expressive.

They then visited the Laboratory where I showed them a few microscopical marvels. Arranged diatoms seemed to be a vision of a new world. This was succeeded by the tritest of "Oh, my!" slides, and my callers lived up to their reputation. In the last few minutes, as they were about to leave me to overtake a train, I told them I would show the acme of the evening's exhibition. I placed under the lens, and carefully adjusted the light, one of my best slides. It was a joy to hear

their words of delight. "I had no idea that there is anything in all the world so beautiful as this. Come here and see it."

The second lady said, "What marvelous structure! What beauty! How you must revel in this study of nature!"

The third came. "What is that? I have never seen anything quite so beautiful. You have indeed kept the best for the last."

Sphinx-like I remained silent and still. Then there came an almost unanimous cry, "What marvelous beauty! I have never seen anything so interesting as that last view. It will live in our minds for days. Please tell us what it is."

As they passed through the door, and for a moment stood on the walk, I said, "It is a bedbug."

Is He a Philosopher or a Fool?

A man as bald as a billiard ball went into the barber shop at the Hotel Statler, Detroit, and found there a skilled but Sphinx-like barber that uttered not a word, not even of greeting as the customer took the chair. After the shaving, the bald-headed man said, "In lieu of comb and brush as applied to other people, you may just wipe off my head with a towel." These words unsealed the barber's lips. He said, "No, sir: all that get shaved in this shop receive the same treatment, and you will have brush and comb like all the others. We believe in treating everybody alike. If I even touched your head with a towel I should charge you for a shampoo; that is the rule of the shop."

"But," astonishedly exclaimed the bald-headed man, "There is not the slightest occasion to use brush and comb on me. Your rule does not apply in this case." But the barber said, "Suppose you had gone to the manicure, and had lost one of your fingers, would you expect her to make a reduction for that?"

"Like many another logician," the bald man said, "your argument is faulty; the cases are not parallel. You should put it this way: 'If you, Mr. Customer, had lost all your fingers and had gone to be manicured, would you expect a reduction?' Your philosophy is rank foolishness." But still the barber insisted, "With even the slightest use of the towel it would be a shampoo, according to the accepted

rules of the shop. A little shampoo, or a big shampoo, or a long shampoo, or a short shampoo, all amount to the same thing. It is merely the customer's preference as to whether he should have any kind of a shampoo. Even a single sweep of the towel over your head would be rated as a little shampoo, at full price."

Then said the customer, "This, I see, is a technical shop. You are a stickler for the rules. I insist upon having all to which my payment for a shave entitles me." The barber accepted the situation, although he repudiated his own logical conclusion in doing so. He dashed on the bay rum and rubbed the head with the ends of his fingers as vigorously as he doubtlessly had done for forty years on heads like Paderewski's and the football players'. Then as gravely as if he were manipulating magnificent tresses, he combed the imaginary hair, and brushed it back in gracefully flowing but imaginary curves. He had done his duty.

* * * * *

Thanks, Mr. Barber, for your philosophy or foolishness. Your bald customer is a lecturer on the philosophy of the schoolroom and you are not the only one who applies general rules irrespective of individual cases. "Master Pupil, you have come to my schoolroom. It is an impartial place. Though you lack brains, though you lack physique, though you are precocious, though you are advanced far beyond the class, it is my duty to apply to you the regulation comb and brush, our hirsute equipment in intellectual pursuits. This schoolroom knows nothing but brush and comb. It has applied them for forty years."

Though the times have changed and the authorities are considering a new treatment for certain educational problems, though new features are inserted into the curriculum, still, the Sphinx-like teacher, mute to modern suggestions, ignorant of modern innovations, will still apply the brush and comb. He will not adapt himself to new studies, and he will not leave much doubt as to whether or not he is, like that barber, a philosopher or a fool. The barber's philosophy is folly. We are sure the reader will instinctively apply to many occupations and especially to many a retired business man who has used the brush-and-comb method of money getting assiduously for forty years or more, until he can recognize and

accept no other treatment nor adaptation to a changed situation. The brush and the comb shall be applied in his retirement as it was in active days, and the bald man may well inquire, in many occupations, "Is it philosophy or folly?"

Good Things Out of Nazareth!

Every naturalist, and especially every meteorologist is familiar with the photographic work with snow crystals and frost forms done by Wilson A. Bentley of Jericho, Vermont. He began his career along that line when he was only a boy and has devoted his attention to it with a persistence and a skill equal in some respects to those of Edison. He too is self-educated; no college can claim him.

Recently the editor, while visiting the schools of a western city heard from the drawing teacher of her interest in Mr. Bentley's photographs and of her use of them in her teaching. She regards them as works of art, exquisite, and beautiful beyond description. Imagine her astonishment when another teacher expressed surprise, saying, "Is it possible that you use those photographs in the school work of a city like this? Don't you know that Mr. Bentley is not a college educated man!!!!!!!"

The Best Magazine in the United States.

Can anybody decide which is the best magazine in the United States? Magazines cover so many and so various fields of activity that among many of them there cannot be much comparison. For example, there can be no comparing of a magazine devoted to horses with one devoted to postage stamps, or another to school-teaching. But there can be, and there is, such a thing as *the* best magazine, for the reason that it takes the best from every other magazine. I fancy that if a really good article should appear in any magazine on horses, postage stamps or pedagogy, you would find that article reproduced in "The Literary Digest," a periodical that stands head and shoulders above any other magazine that is attempting, or has attempted, to give a summary of the thought and teaching as expressed in all classes and types of journals.

It has been truly said that every per-

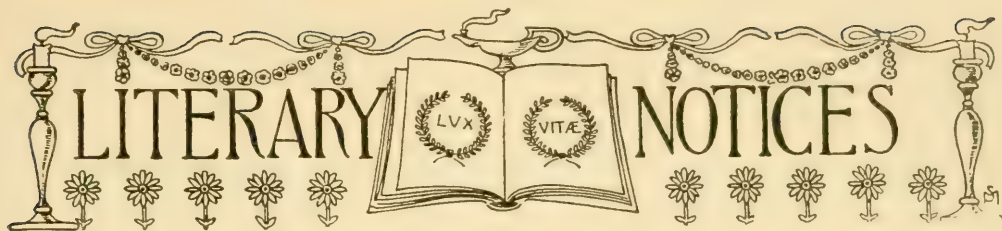
son should know everything of something and something of everything. This magazine gives the readers the cream of everything worth thinking about. You will here find discussed not only what the newspapers are saying, how the politicians are whacking each other, how the war is progressing, who has made a new scientific discovery, but also what writers are achieving fame in the world of fiction and of poetry, and what is the current need of religious and social service. Indeed, it often offers thoroughly practical advice as how to spend money or how to get along without it.

But what is the use of trying to praise "The Literary Digest?" We might as well talk of the sun's beneficial rays. Everybody is familiar with the good qualities of both, or should be.

Professor Robert M. Yerkes of Harvard University, probably the foremost animal psychologist in the country, makes a plea for more attention to the apes, baboons and monkeys. We know, he points out, something about their bodily structure, but almost nothing about their mental operations. Yet these creatures are nearest of all brutes to ourselves, and the study of them would probably teach us more about ourselves than would that of any other of the lower animals. The Germans have a special station for the study of apes, located in the Canary islands. Professor Yerkes argues for establishing a similar laboratory somewhere in Southern California.

The newest earthquake recorders are so sensitive that if a person sit quietly in a chair near one, and then change to the side opposite, the earth's crust will spring sufficiently under the changing load to show on the record. No wonder, then, that an approaching storm is indicated by a rising of the crust under the diminished pressure of the "low."

A recent study at Cornell University shows that in the hibernating woodchuck the body temperature falls from the normal ninety-eight of the warm-blooded animals to a little above forty. At the same time, the carbon dioxide in the blood nearly doubles. Four to six months is the natural duration of the winter sleep.



THE EMBRYOLOGY OF THE HONEY BEE. By James Allen Nelson, Ph. D. Princeton, New Jersey: Princeton University Press.

This book was needed; Dr. Nelson has well supplied that need. We owe a debt of gratitude to him and to the Princeton University Press for giving us this permanent record of an intensely interesting scientific investigation. The apiarian magazines have had much to say about it, the embryologist will find it valuable, but we especially desire to call attention to it on account of its interest to the microscopist. The book gives him something to do along a fascinating line of investigation. The drawings may be easily understood and followed by even the novice in microscopy, as they are beautifully plain and clear. The book is one of the most delightful guides that have come to the reviewer's desk.

THE CHARLATAN'S PROPHECY. By George Klinge. Boston, Massachusetts: Richard G. Badger, Toronto, Canada: The Copp Clark Company, Limited.

While this book does not come within the immediate scope of THE GUIDE TO NATURE we are glad to give it notice because of the well-known work that the author did in the department that she formerly conducted in this magazine, under the title of "The La Rue Holmes Nature Lovers League." She is a nature lover, and a student of considerable ability and much enthusiasm.

"The Charlatan's Prophecy" is a romantic love story, well worth reading, not only for entertainment, but for its educational value. The scene is laid in the Thirteenth Century, during one of the most exciting periods in the history of Venice.

THE AMERICAN BOYS' BOOK OF BUGS, BUTTERFLIES AND BEETLES. By Dan Beard. Philadelphia, Pennsylvania, and London, England: J. B. Lippincott Company.

"Is there a boy with soul so dead
Who never to himself has said
'I like the woods and swampy places
More than stiff shirts and whitewashed faces?
I love all bugs, fish, worms and mice
Live outdoor things I think are nice;
To follow Dan on walks and hunts
Will make a man out of a dunce.
And 'tis for this I say to you
Go buy his book and read it through.'"

Dan Beard stimulates boys to go out into the woods and fields to develop a love of the beauties and a curiosity concerning the mystery

of nature, to observe and understand the ways of living things. The man who does this is the man of whom parents are glad to hear as they realize that his books must be of more real value to their boys than are the common and multitudinous stories of athletics and crude adventure.

Dan tells the boys in his own inimitable way of the fun and value that is derived in making a collection of insects. If the boy has this book, whether he is in the suburbs, the far country, the mountain or the seashore he will be happy; he will have plenty to do. It is not only in the summer that fun may be had with the little winged and armoured creatures, for in the winter some of the most fascinating discoveries of cocoons and insect life may be made.

The especial aim is to tell the boy the value of a collection of bugs, butterflies, and beetles, the habits of the most important members of the different tribes, and the best methods of capturing and preserving the specimens. Making this collection will be the most useful one a boy can make. The birds are the friends of men—collecting their eggs and shooting them may well be considered a crime—but the bugs are usually enemies, they ravage our gardens, poison our orchards, and kill the proudest monarchs of our forests. Let all boys read this book, become impregnated with the divine fire, and take sides with the birds in a relentless war upon the army worms, the gypsy moths, the potato bugs, and all the rest of the host of pillagers that prey upon our food, our lumber and our flowers.

A curious variety of the common fresh water clam, *Unio complanatus*, is reported from western Maine. The region is one in which there is no limestone, and where even the fieldspars are virtually all soda. The result is that the creatures find almost no lime in the water from which to build their shells. Therefore they thicken the epidermis of the normal shell to about twice the common amount, and often embed grains of sand in it. The shape of the shell, also, is somewhat different from the commoner form, being almost identical with that of *Anodonta marginata*. The variety is especially abundant in Oxford County, Maine; it occurs, however, sparingly, at other points in the granite area of New England where lime is wanting.

CORRESPONDENCE AND INFORMATION

Dan Beard's First Interest in Nature.

[In "Literary Notices" of this number mention is made of Dan Beard's recent book, "The American Boys' Book of Bugs, Butterflies and Beetles." Reading that book suggested writing to the author and inquiring how he first became interested in insects. He tells us in this letter that he began as a baby watching flies on the windowpane.—Ed.]

Flushing, Long Island.

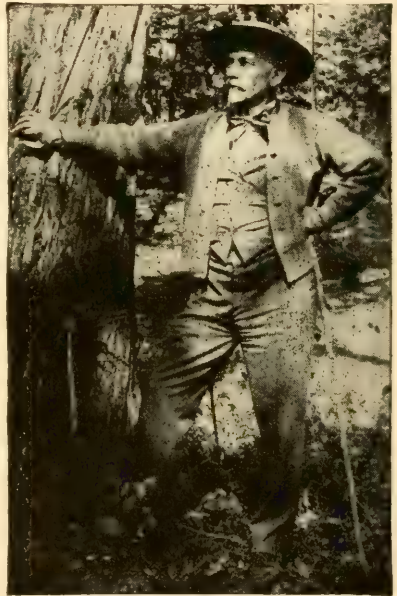
To the Editor:

The little things of the world play an important part back in the dawn of life, that part of one's life of which we are only conscious because of certain well remembered experience. The rising sun of life seems to strike and illuminate the minute things in place of the big things and these illuminated incidents are the ones we remember in after years. My memory tells me of spending much time watching the flies on the windowpane; I thought they were pigeons, because to my baby mind and sight untrained to perspective, the pigeons outside, flying among the housetops, appeared to be the same size as the flies on the windowpane—both were alive and both excited my baby interest to that degree that I can still recollect them, although the time previous and considerable space following are blank pages.

Then again I can remember sitting on the front steps of a house on Longworth Street, Cincinnati; it was the fourth of July and I was experimenting with lightning bugs and wondering why I could not set off a firecracker by the light in their tails. I must have been three years old or probably less. Both these incidents excited my interest in the study of insect life.

The next occasion which has left its impress upon my memory was in Painesville, Ohio, where I attended the little red brick schoolhouse in the grove and where I was flogged for breaking my slate over a colored boy's head. The Western Reserve, it must be borne

in mind, was a section of the country settled by Abolitionists and the colored children went to school with the white children, a thing to which I was unaccustomed, so when they seated a colored boy at the desk with me, I thought it was an intentional and gratuitous insult and smashed my slate over the



DAN BEARD.

poor lad's head to the great delight of the scholars and the horror of the teacher. A lath was taken from the wall where the plaster was broken off and with that the teacher flogged me. I went home and told my mother all about it; to my amazement she laughed. She understood the situation, I did not; she patted me on the head, gave me some cookies and said nothing more. The next day I played hoopkey from school and spent the time in the cornfield watching the ants. Indeed I became so absorbed in my ant study that I neglected to watch the time and come home when school was out; in fact if I remember aright I was late for dinner, as the midday meal was then called.

But my good mother understood this situation also,, and putting her arm around me, she gently said: "You must hurry through your dinner and *go to school* this afternoon." That is the only reference she made to my truancy and that was the only time in my life I played hookey from school. But I really learned more in the cornfield than I did at the little brick schoolhouse, and thereafter all insects possessed a permanent charm and interest.

It was after this my mother taught me where to look for the chrysalides of the Monarch butterfly or, as we called them, the milkweed butterfly, on the underside of the top rail of the white, paling fence in front of our little cottage. These green and bejeweled chrysalides were to me fairy creations; I thought them even prettier than the butterflies themselves. After that, I became interested in the beetles on the grapevines and the study of the grubworms and their transformation into the beetle. Later, as a young man in the city engineer's office in Cincinnati, I made a habit of collecting all the caterpillars and putting them in the drawer of my drafting table. All the other surveyors used to add to that collection; it was then that I spent some of the first money I ever earned in buying a "Packard's Introduction to the Study of Insects."

I had no desire to be a scientific entomologist, I only wanted to know the habits of these creatures and to be able to identify them at sight. I looked upon them as one of the branches of natural history and an important branch. The birds, the beasts, the reptiles and the plants were all equally attractive, but there was no Packard's Introduction to the study of birds, beasts or reptiles. However I did secure Dana's geology which was of great aid to me with the fossils with which the hills of Cincinnati abounded.

Ever since those days, I have looked upon the insect world as the kindergarten and grammar school for nature study; little things always attract little folks; a little horse or pony, a little man, like Tom Thumb or Commodore Nut, a tiny woman like Mrs. Tom Thumb or Minnie Warren, a wee little coach like that in which these dwarfs used to drive through the city streets,

all possess a greater charm for the children than do any giants or the big animals like the moose, the elk or the buffalo. As for the elephant, that has always been a source of terror to little people.

A little playhouse will attract the attention of all the children who may pass by, while a magnificent palace, upon the grounds of which the playhouse may be situated, will be unnoticed by them. Fairies have more charm for children than giants; hence it is that I am satisfied that in the study of nature, the natural way and the proper way is to begin with the insects while the students are very young. As they grow older, the larger animals will be of interest to them. But wild flowers, anemones, bloodroot, jack-in-the-pulpit and violets are more charming and more attractive to children than the most magnificent forests or even the big trees found in the mountains of California.

Insects interested me when bears, deer and buffalo would have frightened me. Even Santa Claus' rig, in order to please the children, is described as consisting of "a *miniature* sleigh and eight *tiny* reindeer, with a *little* old driver."

This is a psychological phase of the childish mind which has not been taken advantage of heretofore in nature study, but which induced me to write my books on "Bugs, Butterflies and Beetles," for the boys.

DAN BEARD.

A new disease of the orange and other citrus fruits is reported from Florida, introduced apparently from Japan.

The Royal Ontario Museum has lately acquired a set of minerals from Baffin Land, which lies west of Baffin Bay in about the latitude of the North Magnetic Pole. The specimens include scapolite, rose quartz, serpentine, spinel, actinolite, graphite, cordierite and garnet. The deposits of the last three may be commercially valuable. The rocks are in general about like those of Canada and northern New England—largely gneisses and limestones of Archean age.

Meditation Couch.

Warren, Ohio.

To the Editor :

This picture suggests a resting place in a forest of spruce trees, but there are only two rows of trees, each row fifteen hundred feet long and the trees six feet apart. They were set out years ago as a windbreak for a pear orchard. Approaching to within a few feet of the

the head, one in the middle, one at the foot, and two pieces of burlap spread over them, my couch is complete, and you may look at its picture and be envious.

The mosquitoes have not troubled me. If they do, I will put on my bee veil and gloves.

Yours very sincerely,

W. W. LATHROP.



MEDITATION COUCH.

trees, on the left in the picture, is a large field of tomatoes. On the right, six or seven feet from the foot of the couch, is a row of beehives of which the writer is manager. On Sunday he leaves the city and with his dinner in a basket and such reading matter as he likes he comes to this restful place on the "Whiting Farm" a mile and a half from Warren, Ohio. There he can listen to the hum of the bees, the song of the birds, and see the blue sky and the tumultuous clouds through the tops of the evergreen trees and read and sleep to his heart's content.

The couch was made in this way. When in the spring I cut the grass around the beehive, I allowed it to dry. With it I stuffed three old burlap bags, and put them in the little honey house where I store my bee tools and extra hives and everything that I want to keep dry.

On Sundays, when I go to see the bees, and am ready for my recreation. I take two hive covers and place them against the tree to form the slanting head of the couch. With one bag at

A Letter from the Tropics.

La Ceiba, Honduras.

To the Editor :

I realize that I have partly promised to write something about the natural history of this summer land, but I have been here for only a short time, and the subject is too extensive to warrant more than a vignette—a bird's-eye view—in one letter.

There is a wealth of material here for the naturalist, as well as for the mere lover of nature who professes no scientific attainments. The writer can claim to be only an appreciative seeker after knowledge, but he is keenly alive to the "spell of the tropics."

A scientific friend envies my opportunity to roam among the interesting things that I find here, and I envy the scientific training that would enable me to profit from this opportunity. Yet to the earnest seeker after knowledge there is always opportunity to pursue independent investigations which may possibly enlarge the sum of human knowledge. It may be trite to say, but it is eminently true that the world is full of wonders. This is empha-

sized nowhere more emphatically than among the insects, in which the writer feels an especial interest. Here, for one from the temperate zone, there is an unbounded field for study and research. A lifetime would not begin to be sufficient to exhaust its possibilities.

At one's first visit in the tropics, the very weeds that one tramples underfoot possess a strange interest. The whole environment is new, different, full of the charm that envelops mystically the unknown—the unexplored.

From the day when, at early dawn, the steamship's hoarse whistle signaled its approach to the land and brought me to my feet to peer through the fading shadows of the dying night at the indistinct, cloud screened mountains, I have been busy, when time from business permitted, with the keenness of the novice in the study of nature's mysteries, and in becoming acquainted with my new environment. That first day I learned to realize what all dwellers in the tropics know—the rapidity with which day comes on, and the equal haste with which the curtain of night falls. Expecting nothing but rain at that time of the year—it was early in November—we found, as the distance between the ship and the land melted away, that over there beyond the cocoanut palms fringing the beach the day was fair, whatever the night may have been. The introduction to our new home was promising. It did not matter that for three weeks there had been an almost continuous downpour of rain. Now the sun was shining, though clouds still shrouded the mountains that were alluring in their verdant loveliness.

Honduras is a fair land. To the naturalist it is full of wonders, many wonders still to be uncovered. Whether this be the best or the least favorable season—I am writing just before Christmas—I cannot say from my own experience, but the array is so wonderful that I am content to take things as they come. Flowers bloom, fruits ripen, birds flit among the trees and gay butterflies dally among the flowers now, as they do the whole year through, and if, when the rains are over, more life should manifest itself, then this must be a busy world indeed.

Most persons picture a burning sun, blistering sands, parched throats, sweltering days and stuffy nights, when thinking of "the tropics." The tropics have all such; but here it is not so bad. The

nights are cool and one sleeps under a blanket, or maybe two, with the thermometer at seventy or seventy-two degrees, and to-night, at eight o'clock and with a cold wind and drizzly rain, it is sixty-seven degrees. The noonday temperature in the shade is eighty degrees, occasionally a little warmer, and if it be raining perhaps not more than seventy degrees. But the sun is hot.

I had always supposed that a seabeach in a land like this would be strewn with marine treasures, the argosies of the waves bringing tribute from the deeps, strange shells of colors rare, seaweeds with which the queen of the mermaids might deck herself, unheard-of wonders and endless surprises. But it is nothing like that. The beach here is clean and bare; only a few wave worn pebbles, sand crabs and a shell now and then rubbed perhaps into a faint memory of its original glories by the friction of the sands. On the islands off the coast, faintly discernible in clear weather, there are shells and mosses, corals and sponges, but here the north winds seem to whip all life into nothingness. It is on the land that one finds his treasure-trove. And some day perhaps I may be able to tell you something about it, although it is, in truth, difficult to know where to dip into the abundance of material that presents itself on every side.

FRANCIS J. DYER.

Curious Behavior of a Plant.

Our common "water net," *Hydrodictyon reticulatum*, is rare in England. Reports, however, come of its very sudden multiplication, so that workmen have to be set to raking out the masses and piling them in heaps on the shore. Then, in less than a month, the entire growth disappears, so that careful search fails to reveal so much as a single plant.

One wonders whether Mr. G. G. Wells, in his story of "The War of the Worlds," did not get from this his idea of the "red weed" introduced from Mars, increasing till it choked the streams and then perishing almost in a night.

Is not January the hardest month to get through? When you have weathered that, you get into the gulf stream of winter, nearer the shores of spring.—Thoreau.

THE AGASSIZ ASSOCIATION

Established 1875

Incorporated, Massachusetts, 1892

Incorporated, Connecticut, 1910

For Progressive Work.

Chapter 1063 of The Agassiz Association was organized in the Durham, North Carolina, City High School early in December, with a membership of thirty-seven. The following officers were elected: Chapter President, Bert Cunningham, Teacher of Biology; Secretary,

pleasure and information. To accomplish this we are individually studying various plants and animals and reporting on them to the Chapter. We are taking and *reading* THE GUIDE TO NATURE as well as "Bird-Lore." We have also been interested in reviewing the lives of great men in science. Agassiz has called forth our admiration. We all love the things for which he stood. The second of our two



OUR PROGRESSIVE CHAPTER OF DURHAM, NORTH CAROLINA.
Holding their Charter.

Margie Rogers; Treasurer, Samuel Murry; Assistant Treasurer, Mozelle Wilkerson. Committees were appointed to look after the executive, programme and social features. Wallace Bunn was selected as the operator of the projection lantern.

Since our organization we have held weekly meetings, and have had reports on vaccination, flies, typhoid fever, ants, molds and tuberculosis. Some of these were illustrated with lantern slides.

We are this year working for two special objects. The first is personal

objects is to lay the foundation for progressive work that shall make the high school a center of civic biology. To accomplish this we are collecting and classifying as far as possible the plants and animals that we can obtain, thus starting what we hope will be a permanent museum.

We expect to take an active part in any civic biological problem, and we believe that prevention is better than cure. We hope to be able to report some interesting developments in the near future.

We are enclosing flash light photograph of the Chapter.

BERT CUNNINGHAM.

With Our Local Chapters.

In the January number of *THE GUIDE TO NATURE* extended reference was made to our Five Fires Chapter of Greenwich. The recently elected officers of this Chapter are: President, Mrs. C. D. Lanier; Vice-President, Edwin W. Lewis; Recording Secretary, Becky Lanier; Corresponding Secretary, Robert Lewis; Treasurer, Roger Cameron Edson; Curator of Collections, George L. Storm, Jr.

The Putnam Chapter of the Greenwich Academy has recently reorganized with the following officers: President, Bethiah F. Waterman; Vice-President, Louise Brush; Recording Secretary, Constance Taylor; Corresponding Secretary, Amolie Scholermann; Treasurer, Elizabeth Richardson.

A second Chapter, known as the Putnam Junior Chapter, has also been organized in the Greenwich Academy. Of this Chapter the President is Constant MacRae; Vice-President, Eleanor Pier; Secretary, Elizabeth Anderson; Treasurer, Margaret Houston.

A Chapter organized in the Rogers School of Stamford has elected as its President, Frank Hickey; Vice-President, Vincent Smith; Recording Secretary, Thomas Butler; Corresponding Secretary, Hattie Coblentz; Treasurer, John Greaney.

Recent Additions to Our Membership.

Corresponding:
Winifred Sackville Stoner, Jr., Wilmington, North Carolina.

Mr. Isaac O. Frederick, Harleysville, Pennsylvania.

William Pratt McLaren, Stamford, Connecticut.

Mr. William R. Lodge, Cuyahoga Falls, New York.

Miss Barbara Schmidt, Harrison, New York.

Mr. Ludwig Schwieters, Lower Lake, California.

Mr. Herbert H. Miller, Norwood, Massachusetts.

Mr. Louis Agassiz Shaw, Peterboro, New Hampshire.

The Bureau of Fisheries is experimenting with raising shad in ponds as a fresh-water fish. Results thus far are encouraging, the young fry making about twice the growth as in the ocean.

Item from a Local Newspaper

Dr. Edward F. Bigelow, of ARCADIA, entertained the Holy Name Society of St. Catherine's church, of Riverside, on Monday evening at Welcome Reception Room. Dr. Bigelow's lecture was one of the most interesting and instructive he has thus far given at ARCADIA. Father Coleman made some remarks pertaining to the Agassiz motto *Per Naturam Ad Deum* which is a sermon in itself. About fifty were present. A fine musical program was rendered. Scherzo by Mendelssohn, Marche Mignonne by Poldini were the selections played by Miss Viola Worrell at the piano. Miss Demarest delighted the guests with the following songs:

Winter Song.....Fay Foster

Shepherd Cradle Song.....Somervell

I Hear You Calling Me.....Marshall

The Moon Drops Low.....Cadman

The Naughty Chrysanthemum....Saltes

—*Greenwich News and Graphic.*

Snakes and the Mexican War.

Troubles along the Mexican boundary have resulted in a peculiar snake condition. We find it difficult to obtain large specimens of the western diamond-back rattlesnake, owing to the fear of collectors to venture within that bullet-infested region. A collector in Texas who zig-zags back and forth across the boundary line wrote us recently as follows: "I can't catch any big rattlesnakes now. On my last trip the only thing I got was a collection of bullet holes through my new Ford car. They said they didn't shoot at me, but this didn't make me feel any better." The collector mentioned brings in as many as two hundred rattlers in a week's trip! He does not bother to pick up specimens under four and a half feet in length; and many of them are over six feet long and twelve inches in circumference. These big rattlers seem imbued with the fighting spirit of the region. When first placed on exhibition they rattle continuously for hours. The Texas collectors sell their rattlesnakes in novel fashion, charging not according to the length of the individual. After selecting specimens of the required size they weigh them, and sell them at thirty cents per pound! —"N. Y. Zoological Bulletin."

FOR GROWTH AND EFFICIENCY

Members and Other Friends Who have Aided in the Expenses of The Agassiz Association.

Mr. Ellis B. Noyes, Virginia— balance of \$1.00 per month for one year	\$ 5.00
Reverend Charles Morris Addison, Stamford	5.00
Miss Dorothy A. Baldwin, Massachusetts	5.00
"Neighbor," Sound Beach	10.00
"Land Aid," Massachusetts.....	50.00
Miss Frances H. Errett, Ohio	50.00
Mr. Samuel P. Avery, Connecticut—\$25.00 and \$50.00....	75.00
"Interested Visitor," Stamford	2.00
Mrs. O. H. Stevens, Massachusetts	2.00
Mr. H. E. Valentine, Massachusetts	1.00
Miss Helen Zipfel, Connecticut "A Lover of Astronomy," Massachusetts—at \$25.00 per month	225.00
Mr. Walter Neumuller, Sound Beach	2.00
Mr. Frank J. Myers, Pennsylvania	8.50
Honorable Zenas Crane, Massachusetts	50.00
"Wishes for Success," Stamford	25.00
Mr. Ed. Sandreuter, Stamford	10.00
"The Right Spirit," Stamford	20.00
Chapter No. 1015, Glenbrook, Connecticut	3.00
"Timely Assistance," Massachusetts	100.00
The Fairhope League, Greenwich	5.00
Mr. B. M. Ayres, Stamford	5.00
Mr. Henry Miller, North Stamford	25.00

\$684.50

Aid on the Loan (\$197.20) from the AA General to the Fund for the Astronomical Observatory.

Mrs. Charles Tarbell Dudley Greenwich	\$10.00
Mr. Charles A. Brunn, Kansas City, Missouri	10.00

\$20.00

Just as we go to press the remainder of this loan, with a surplus to the AA, has been paid by an amateur astronomer.

Miscellaneous Contributions to ArcAdia.

Mr. S. C. Hunter, New Rochelle, New York: sun diagonal for telescope.

The Greenwich Library, Greenwich, Connecticut: five scientific books.

Mr. R. M. Allen, East Orange, New Jersey: microscopical mount of wolf spider.

Mr. H. E. Deats, Flemington, New Jersey: three waste baskets similar to several previously supplied.

Mrs. George Peirce, New York City: interesting botanical specimens.

"To Change this Weakness into Strength."

[EXTRACT FROM A MEMBER'S LETTER]

I confess that the connection of theoretical studies with the real life that is throbbing around us in our immediate neighborhood, is not alive enough at least in my case, and that it is a strong desire in me to change this weakness into strength. Therefore I have gladly become a Member of The Agassiz Association.

I am strongly interested in opening my children's and my pupils' eyes to the wonderful Book of Nature around them, of which they are an integral part themselves, and to protect them from becoming mere theoretical bookworms, as I had been one during a certain period of my life.

But of course a one-eyed man is a poor guide for the blind ones, and therefore I am longing to get the old bookworm dust off my mind and establish more immediate connections with Mother Nature.—L. Schwieters, Teacher, Lower Lake, Lake County, California.

He Sets a Good Example.

Kansas City, Missouri.

Dear Dr. Bigelow:

The March issue of THE GUIDE TO NATURE at hand. Turning its pages, I find, on page 334, that you owe the AA general fund nearly \$200, borrowed for the observatory. I enclose check for \$10.

You have done splendid work in securing the observatory. AA members and friends should permit you to balance your books without a deficit.

Wishing you abundant success, I remain,

Very truly,

CHAS. A. BRUUN.



What is in the Name "ArcAdiA"?

"Why do you spell ARCADIA with three capital A's?"

Answer: "Because that is its name."

"Why did you give it a name that requires that unusual spelling? Why did you not call it merely Arcadia without the three capitals?"

These questions in various forms have come from many readers and from local friends.

We selected ARCADIA, with the special spelling, much against our will, because we recognized that it might be regarded as freakish and as breaking the rules of orthography, but, after careful consideration, we were unable to find another word that would exactly express our idea.

If we were to take the word as it was originally used, and as it is now used in many places, it would be far from expressing the complete idea and the fundamental principle for which this ARCADIA stands. The old Greek Arcadia is defined as "a picturesque district of Greece, inhabited by a simple, pastoral people, distinguished for contentment and rural happiness. Hence, any region or scene of simple pleasure, rustic innocence and untroubled quiet." The inhabitants were "fond of music and dancing," and the god of Arcadia was Pan.

We like the picturesque beauty, the simplicity, the contentment and the rural happiness; we like the simple pleasures and the untroubled quiet, but that is far from all we wanted to express. There are thousands of households in rural districts that live in simplicity and contentment.

We had no thought of transferring that Greek name to our Institution, for the word expresses only a part of what we would have it imply. We see no way to use the word in its original form and to add the qualities that we wish these headquarters of The Agassiz Association to represent. Most persons forget that

Arcadia was presided over by the mythological Pan. The Arcadia of Greece was coarsely atheistic. It was presided over by an imaginary god of pasture, flock and field. He was represented with the body and head of an elderly man, the hind quarters, the horns and the ears of a goat. Terror was ascribed to him, and from his qualifications we get our modern word, panic.

The essential element of this Institution is to take fear out of the heart and to show young and old that there is nothing to fear from that old mythological panic point of view. The aim of this Sound Beach ARCADIA is to inspire love for nature through investigation and thorough study. We have no cognizance of an imaginary god that may, for his own amusement, throw us into a panic when the thunder growls in the distance or the wind lashes the trees; we accept God as our guide and leader. Our nymphs are Love, Study, Interest, Enthusiasm and Beauty. We therefore do not want to take the term Arcadia with what it contains. We should like to lead the simple life and enjoy a nearness to nature without the atheism and the periodical panic. We cannot use the word to signify what the Greek Arcadia signified. So we will incorporate into it the scholarly, religious spirit of that grand man, Louis Agassiz, for whom our Association is named. In his memory it stands, not only for simplicity and innocence, not only for pastoral beauty, but for a sincere belief in a living Deity, and for an intellectual and heartfelt interest in nature that shall combine that interest in nature with an interest in religion. Agassiz said, "A physical fact is as sacred as a moral principle." We wanted a name to represent all this, and we must therefore have it somewhat like a monogram. We have selected ARCADIA. It embodies the old idea and the new. If anybody can suggest another word that will embrace these qualifications and express the idea of simplicity and of innocent happiness, com-

bined with Louis Agassiz's scholarly ideas, and transforming the old panic idea into thoughts of love, then we shall be glad to receive it.

ARCADIA, therefore, with its own particular spelling, means this particular Institution at Sound Beach. The Institution stands for all the beauty and the happiness of the original Grecian Arcadia, and, as indicated by the capital A's in its name, has as the beginning, the principal aim and the central point of view—the first and the last, the first and the middle, and the middle and the last—The AA (The Agassiz Association) permeated and threaded into all nature.

Any correspondent or any publication that uses the name of the Greek Arcadia is using a name that does not apply to us. The old Arcadia has been transformed as the old Saul was transformed into the loving and devoted Paul.

There is no law, Mr. Editor, applicable to us, or to any of our correspondents, to stop our use of the term ARCADIA, the headquarters of the world-wide Agassiz Association, situated here at Sound Beach, Connecticut. It is ARCADIA; it is not anything else. We spell it with the three capital letters, not to be freakish, but for the reasons that we have given. It has been used for nearly six years. Most newspapers and correspondents have accepted our spelling, but there are some that still say that he should be called Zacharias when we know that his real name is John.

We often see the necessity of coining a new word to meet a new situation. A man may take two family names, put a hyphen between and a capital letter after the hyphen. In reality it is only one name.

Two newspapers merge into one and invent a new word, as, for example, "Globe-Telegram"—one word with a capital in the middle of it.

Coining new words is a well-known pursuit. Take, for example, The Uneeda Biscuit Company. Who gave the Company authority for the phonetic spelling of *you* by the letter U? It is generally recognized that they have a right to do that, and the public acknowledges it by buying their wares.

Originally a certain bird found in the lowlands was called a meadow lark, but all the ornithological books combine the two into one, and the bird is now the

meadowlark, with not even a hyphen in its name.

Previously to the establishing of this Institution at ARCADIA we do not believe that there ever was a similar representative of ideas similar to ours. We do not know of such. A new thought became a practical application, and necessitated a new word. ARCADIA is such a word; it is not the transference of an old name used hundreds of years ago, and representing something radically different. From the old, heathen idea of Arcadia, we have taken the good, discarded the objectionable; have added the recognition of the true God. ARCADIAN, but not pagan.

An Astonishing Fact Regarding Clover.

Professor Nobbe of Tharandt, Germany, finds that when clover seed is put in water, only about half the seeds germinate. These, he discovers are those which have the thinnest coats. The rest remain dormant indefinitely. But even after a quarter century soaking, scratching the surface with a pin point ruptures the resistant skin, and the seed sprouts within a few days. This, apparently, explains why clover, and various well-known weeds, once they get started in a soil, keep on coming up year after year, although none are permitted to blossom.

It is said that lawns, once planted to clover, no matter how closely clipped, will keep on throwing an occasional clover plant for more than a hundred years.

The so-called "flying spiders" do most of their flying in autumn during the Indian summer. What they really do is to take advantage of the fact that whenever cold nights are followed by sunny days, with the sun low in the sky, every vertical surface of fence, wall, or building exposed to the sunshine becomes much warmer than the general mass of the air. There forms, therefore, late in the forenoon, against the warm surface, a little ascending current of warm air. The spiders take advantage of this fact, throw out a yard or two of web and are wafted off, sometimes for miles, till the air cools and drops them in a new place.

A Queer Trait of the Human Mind.

Modern scientists have tried to tell us why we are afraid in the dark, saying that this defect comes to us from the cave man. Still others ask why a dog turns and why he howls in pain or in delight around several times before he lies down, when certain musical notes are repeatedly sounded. It may be that these traits are inherited from the primitive wolf-dog that made its bed in the forest for the night, and that the notes arouse inherited recollections that extend over innumerable generations to the primitive note of the barking wolf-like dogs.

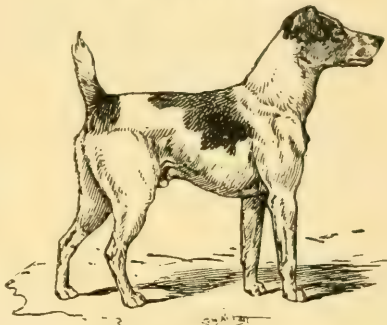
It is interesting to select some such characteristic and to discover or at least to try to ascertain the plausible explanation. For twenty-five years I have been trying to find the cause of an etymological idiosyncrasy of the human mind. I have made my observations among the illiterate and the cultured, the young and the old, and find that the misspelling of the terminal syllable of the word stereopticon is almost universal.

Everybody pronounces it "con," but most people spell it "can." I wish some of our scientists who are fond of investigating the causes, would tell me whether the original cave man had a "can" that he later developed into a stereopticon. I should like to know whether the first stages of the man that succeeded the "missing link" had what is called a "can-can dance." Something must have happened somewhere along the line to explain that "can" in relation to the seeing of objects projected on the screen.

Recently, at least six correspondents, all familiar with the stereopticon and some of them extensive users of the instrument, or at least of stereopticon slides, have overflowed with this "can" idea. We have kindly pointed out, in somewhat emphatic terms, that there is no authority for such spelling of this word.

So I have concluded, that like the rotating action of the dog, it must revert to some previous event in human experience. I therefore make especial request in behalf of composers, printers, proof readers, stenographers, and others interested, that our archaeologists and our paleontologists think deeply and carefully and seek a specimen of the primitive "can" man of "the growler" ages. Possibly odor.

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among prehistoric bones he will find circumstantial evidence of the "can-can dance" that still goes merrily on.

The familiar "ripple marks" formed by the wind blowing across an area of dry sand have been found to travel forward, under a strong breeze, as fast as seven feet an hour.

Sand dunes do most of their shifting during the winter. A ridge which advances only one or two inches a day during the summer may speed up to five feet a day in the cold months.

In each special region of blown sands, the front faces of the advancing dunes seems to stand at a characteristic angle, according to the size and character of the sand grains and amount of moisture in the soil and air. Those at Ipswich, Massachusetts, make always an angle of thirty-two degrees with the horizon.

The characteristic aroma of hops grown in different parts of the world proves not to be due to soil or climate, but to be a fixed quality of the several strains. Bohemian and American hops grown side by side in Denmark each manifested its distinctive and peculiar

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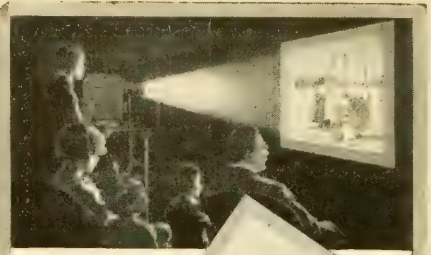
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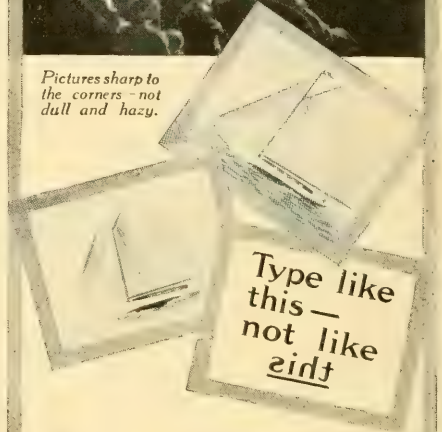
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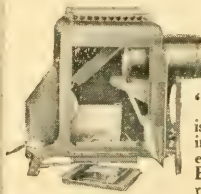


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The Guide To Nature

THERE is nothing that impresses one so completely with his own insignificance as the contemplation of the wonders of the sidereal universe. The egotism of even the most famous of mankind must surely vanish when he views those vast worlds hurtling their way through the limitless voids of space. It is noteworthy that all men who come closely in touch with nature are modest and unpretentious, so long as their researches are conducted in the simple spirit of learning the truth for its own sake. It is only when actuated by worldly motives of greed and desire for fame that they lose that splendid humility which characterizes the sincere scientist when in the presence of the sublime wonders of the infinite cosmos.—Henry Handy McHenry in "Popular Astronomy."

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EDWARD F. BIGELOW, Managing Editor

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Neelgees are among the fascinating garments of which no woman ever had too big a supply. Each new one and each pretty one is sure to find its place. This charming little model represents so little labor that it easily can be added to the list. It consists of just the front and back portions that are tucked prettily at the shoulders but is rendered entirely distinctive and novel by the arrangement of the wide frill. The little cap which accompanies it, is dainty and becoming. In the picture, both the jacket and the cap are made of fine white batiste with trimming of embroidery, but you could copy this model in crepe de chine or in georgette crepe, in a flowered batiste or in a fine cotton voile, in a soft tub silk or an any similar material.

For the medium size will be needed 2 1/4 yards of material 27 inches wide, 1 1/4 yards 36 or 44 with 4 1/2 yards of lace or embroidery for the frill. For the cap will be required, 5-8 of a yard of banding 4 inches wide and 1/2 yard of lace 2 inches wide for the neck frill.

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From a Stamford Poet.

Mr. Marvin R. Doty, the well-known humorist and reciter of Stamford, has caught the spirit of "poetry." He looks toward Arcadian territory and locates his scene in Sound Beach. This is the way in which the muse appeals to him:

A HORNET, one day at Sound Beach,
 Was sunning himself on a peach,

When along came a picker

Who dropped the fruit quicker
 Than scat, and then uttered a screech.

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Sound Beach for Residence.

The entry of this magazine at the Sound Beach post office was June 12, 1909. Since then the home of the magazine as well as of the editor and his family has been in this charming bit of earth, in some respects the finest to be found. It would be difficult to discover anywhere so attractive a combination of seashore, picturesque residential sections, and, a little farther northward, a country and scenery as wild as they were in the days when the Indians fought their battles or chased Laddin off the precipice. It would be a praiseworthy accomplishment if everyone seeking nature at her best and a convenient commutation resort should put into practice the Sound Beach slogan:

Sound Beach on Long Island Sound
My summer home shall be;
Or, better far, all the year around,
And that sounds good to me.

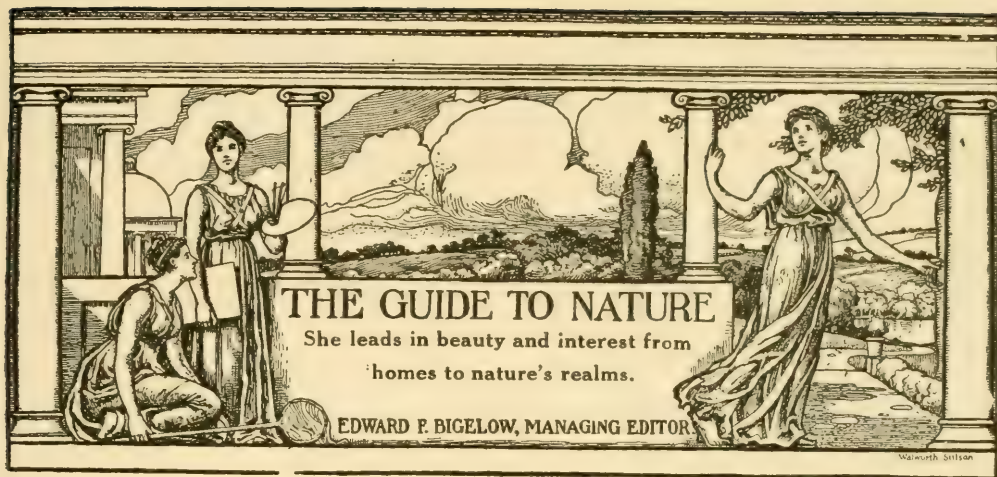
Sound Beach has two helpful institutions in outdoor life, its ARCADIA and its Golf and Country Club, side by side in a convenient and attractive part of the

community. Anything desired for residence may be obtained by addressing the Sound Beach Summer Homes Corporation at Sound Beach, Connecticut (Box 84), or at No 1 Liberty Street, New York City. The editor is personally acquainted with the management of Shorelands and also with its attractive houses and he is convinced that in Shorelands are to be found some of the most pleasing and convenient situations along this part of the coast. If you have not yet arranged for a summer home, address that corporation for further particulars.

A Puzzler.

"Now, sir," demanded the cross-examining lawyer, "did you or did you not, on the date in question or at any other time, say to the defendant or anyone else that the statement imputed to you and denied by the plaintiff was a matter of no moment or otherwise? Answer me, yes or no."

The witness looked bewildered, "Yes or no what?" he finally managed to gasp out.—*The Youth's Companion*.



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Volume VIII

MAY, 1916

Number 12

War on the Wolves of the Sea.

BY AMANDA SMITH GRAIN, SOUND BEACH,
 CONNECTICUT.

A new war—a war on “The Wolves of the Sea,” namely, the shark and all its family, who are the living submarines waging an old and ceaseless war on the food fish, which at this particular time have become a vital asset to the table of the land and our economic conditions. From Maine comes the belief that the rapid depletion of our food fish is due to the shark and dog fish, and not to the loss of the frye by their unaccustomed deep of the sea.

James J. Condon of the United Anglers League, along with C. A. Davis, Chairman of the Maine State Fish Commission are among the leading spirits in the movement to fight these destroyers of our food fish, which include almost all of the shark family, particularly the variety commonly called the “dog” fish, which variety must not, however, be confounded with the fresh-water dog fish found in inland waters. The dog fish is known to every salt-water angler and net-fisherman. A great deal has been written, also considerable legislation enacted, to control the netting of menhaden or what are best known as bony fish, by the use of large and finely equipped steamers, with the idea that these steamers using the immense purse nets, also

take large quantities of eatable fish, which of course, went in with the catch of menhaden to the fertilizer works. These wasted food fish are, however, adult fish and small in numbers, while the dog fish is capable of destroying the small fish by the thousands, and it is safe to assume that a three foot dog fish will consume in the season more small fish than all the eatable fish netted by the largest fishing steamer in the same time.

The entire shark family have borne the reputation of being what is commonly called “man eaters” and in most minds the food of the wolves of the sea is hardly associated with our numerous small food fish, such as mackerel, herring, blue fish, etc., nevertheless it is just these that provide the greater part of the shark family with their substance.

The white shark or man eater is the best known and with the blue shark attain a length of twenty feet and strange as it may seem, these two are exceedingly destructive to food fish, following the schools of food fish, even into the nets of the fisherman, where they do, at times, a great deal of damage. The dusky shark closely related to the former is the most common of the larger sharks on our coast.

Apart from the small and most common variety, the dog fish is the small



LANDED AFTER A LONG FIGHT.

sand shark, also a voracious fish feeder. While all the larger varieties are destroyers of food fish, by far the most common and numerous are the "dog" fish, which swim in schools or packs in pursuit of their food.

These destroyers are of two varieties, the "smooth" dog and the "picked" dog, the former being very abundant south of Cape Cod and ranges in size from two to three feet. The picked dog ranges chiefly on the upper New England coast and is somewhat smaller than the smooth dog, but what it lacks in size is made up for by numbers. No doubt the reason why we should feel the effects of the depredations of these submarine destroyers of our eatable fish to the extent that is attributed to them is that, with exception of very limited organized fishing for them chiefly by the State of Maine, there is no effort made to use or destroy them.

In England there is a well organized fishery for these varieties. The livers

furnishing oil, the skin being used in place of sand paper for certain uses, while parts of the flesh are dried and sold on the markets and known as "Falkstone" beef.

On the coast of Russia, Lapland, Norway and parts of Greenland, the shark fisheries are of importance. Particularly in Norway is the industry carried on extensively by a large fleet of vessels of from twenty to thirty tons burden. These boats go as far as 100 to 150 miles off shore and fish in water to the depth of 250 to 300 fathoms, the hooks being baited with salt seal flesh, and when the fish is hooked, it requires the efforts of three men to drag in the quarry by main strength until its head is above water, when another man proceeds to knock the fish on the head with a large wooden mallet.

Generally speaking, the method on our coast for taking the larger varieties is to still fish using a large hook baited with salt pork attached to a line about the size of a common clothes line, generally made fast to a convenient post or spile, then when the bait is taken, the fun begins. Attaching a baited line to a small floating keg is another method, but in this case a launch in attendance is necessary in order to chase up the keg when the fish hooks himself. A great many large sharks are now taken for sport by the use of the ordinary tarpon rig, consisting of a heavy rod and reel, holding as much as 600 yards of line.

As shark fishing and in particular, for the "dog" fish variety has never been followed up as a business, except off the coast of Maine and Nova Scotia, there will be a lot to learn as to their habits and the best and surest way of getting after them with the sole object of their extermination as far as such is possible. It is one thing for a commissioner to make plans to rid the seas of these pests who are devouring one of our most important table supplies,—but it is altogether another proposition to accomplish this,—first it is no small matter to catch and destroy the vast numbers, considering that the "original crop" so to speak, has never been depleted to any extent by man.

Along the New England coast the sharks and dog fish have become so numerous during the past season that all kinds of fishing has been very poor,

and the waters of the western end of Long Island Sound have been infested with the larger varieties as well as the small. A young woman who was diving in deep water at a resort near New York disappeared, and when the body was recovered it was clearly shown that she had been seized by a large shark.

On the other side of the globe, the shark fisheries are carried on extensively in India, Africa and in China, the catch running as high as 100,000 fish in a season, which are used to supply the demand for sharks' fins.

Aside from the oil extracted from the livers which by the bye, is used to

adulterate cod liver oils, the flesh of the larger fish is ground up and used as poultry food.

The Canadian government recognized the depredations of the shark family and have for sometime waged war on these depredators, especially along the coast of Nova Scotia, where a bounty of 40 cents per hundred weight is paid for all fish delivered to the rendering plants, where these scourges of the sea are converted into oil and fertilizer.

That we have spent large sums and established the most up-to-date hatcheries for the purpose of the propagation of food fish, the truth remains, that we have done but little or nothing towards the protection of the fruits of these hatcheries, dumping the small frye overboard and trusting to luck and quantities for returns.

If our agricultural stations should expend their efforts in distributing seed that was raised at great expense to be sown and then abandoned to rear itself without cultivation, care or protection of any kind, it would be analogous to the results of our system of fish culture—and that the efforts of the United Anglers League and the Maine Commission in their endeavors to interest the authorities of all the Atlantic States and the National Government to assist in ridding the ocean of these "Wolves of the Sea" should receive the support of every one in influencing their legislative bodies to take substantial and prompt action for the protection of the food fish on which we so much depend and which is growing in importance every day in our economic life.

Legislation along these lines has been almost entirely devoted to the protection of fish against the depredation of man who is in reality its least enemy.

After two hours of fishing, the shark in the accompanying picture was caught. It was six and one-half feet long and weighed close to 275 pounds. The line and hook were too light to land the shark, so a heavy line was noosed over its body, so it could be landed with safety. This is a fair sample of the sharks that have been so common on the New England coast the past season.



A WOLF OF THE SEA WEIGHING 275 POUNDS.
Caught off the Island of Nassau and photographed from a near-by boat by Mr. George H. Thamer of Stamford, Connecticut.

An Astonishing Hailstorm.

Spring Hill, Tennessee.

To the Editor:

An eighty-five acre cornfield near my home was ruined by a hailstorm on July 1st. I send a snapshot of the devastated field. Some of the hailstones

usefully directed. In Kissimmee, Florida, a four foot 'gator recently cleaned an obstructed sewer pipe. The municipal water works manager, after racking his brain to devise a way in which to open the pipe, decided to use the 'gator for the purpose. The pipe



WHAT A HAILSTORM DID TO A CORNFIELD.

were ten inches in circumference; five weighed four pounds. Several people had their arms broken by blows from the stones. One negro had his skull fractured. When you take into consideration the thickness of a negro's skull this was truly remarkable.

Yours truly.

BEN G. DAVIS.

An Alligator Cleans a Sewer Pipe.

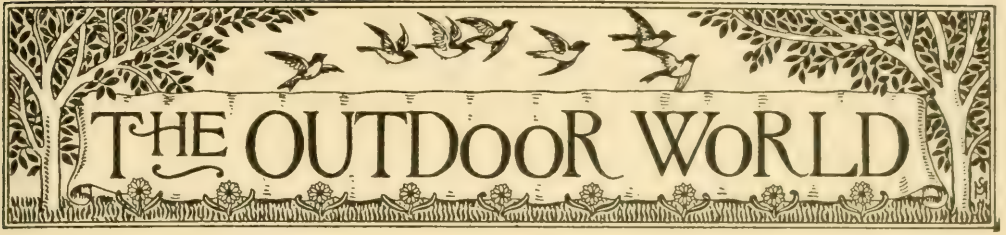
BY THOMAS R. BAKER, PH. D., WINTER PARK, FLORIDA.

The usefulness of the alligator in supplying us with his blotched and wrinkled hide for commercial purposes; his proverbial posing on logs on Florida lakes and river shores, thus giving interested tourists an opportunity to see him at full length, and the sportive ones to shoot at him; and the infant 'gator's meek submission to captivity in northern aquariums or yard pools, where he lives miserably for a short time, are well-known facts.

But the alligator as a business assistant is unusual. For probably the first time his sluggish energy has been

was eight inches in diameter and as long as the city block. With a little urging the reptile wriggled into it and, after a four hours' tussle in the unsavory environment, reached the distant manhole in a lively condition, and received considerable deference on account of his valuable service, for he had done what skilled workmen had been trying to do for several days, and had failed.

Although frogs commonly come up every few minutes to breath, recent experiments prove that they are able to remain under water for an entire week, while occasional individuals can remain submerged for nearly a month. Breathing in these circumstances, is done through the skin, which acts as a gill. Curiously, even after weeks of fishy life, the frog seems not to suffer from lack of breath so much as from general ill health. In some unknown way, nearly pure nitrogen forms in the tissues and swells up the body till the creature can no longer dive.



A May Day Out-of-Doors.

BY SARA V. PRUESER, DEFIANCE, OHIO.
AUTHOR OF "OUR DOORYARD FRIENDS."

"If today a pagan wreath I wear," don't blame me too much for a vagabond am I, following the call of bird through wood and field over hill and river. And who would not on a May day like this shun the narrow confines of a room that seems but a prison cell and slip out of the open door that provides an easy way of escape. So today, I leave the world behind—the city's clash and clatter, its roar and rumble, and into the out-of-doors I go where I find a place among the living things of the universe.

Everywhere in the great horizon, the tender green touches the blue of heaven and only where the habitation of man has introduced his domicil does one see any break in the blue-green color line that forms the eye-boundary of the landscape.

Almost, I had lost the call in the whirr of passing machines, when a field lark sings his clear, whistled song—three plaintive notes float from the meadow beyond. Again, the world is left behind and I push on to the cherished goal—the country.

A Baltimore oriole crosses my path, then sings to the nice ear of his mate from the maples that border the roadside. And from the same trees float the soft, liquid notes of a warbling vireo. Wrens trill madly from post and tree.

The air is full of music. A bluebird halts on an old stump, and warbles a sweet "trua, la, la, la." In its blue black, an exquisite bit of harmony is seen with the blending of the violets below and the blue sky overhead. The male cowbirds utter their hoarse twitters in the tall trees along the way. They and the crows are blackest creatures seen. Yet black stumps and charred tree trunks are seldom their resting places, but oftener do they sit in the upper tree tops, where their creak-

ing notes send a shudder through the woodfolk. A pair of towhee buntings is busily engaged in the thicket, scratching away the last year's leaves and probing about for insects. Song sparrows trill their various roundelays to every passer-by, and the field sparrow sings its ditty over and over again. Sweeter than all, is the vesper's simple chant; not too loud or too low, he sings tenderly a few strains; then drops down among the sedges. The little chipping sparrows flit about the low bushes, and in one of them I find the beginning of a hair-lined nest, hidden away among the green leaves. Blue-jays screech and scold in the trees and the robins carol their love songs to their responsive mates. Clear as a flute, comes the call of the gray-crested tit from the wood beyond. A cardinal whistles a tune to his true love not far away. Suddenly, a phoebe lights on a bare, gray branch, singing its short sweeping notes with a dash and vigor that startles one with its action. A red-headed woodpecker gives a loud shriek as he flaps against a tree trunk where he plants his colors, like those of the German flag inverted—red, white, and black. In pleasing contrast, to his shrieking calls are the contralto notes of the white-breasted nuthatch, as he climbs methodically up a tree; then uttering a low squeal he's off to another one. The squall and mew of the catbird takes me to the tangled wayside growth, where I listen to his song—a spontaneous outburst of rich, rollicking music.

Above the andante and allegretto of weaker notes, rises the strong passionate medley of the brown thrasher. He is a choir to himself, singing each part with the skill of an artist. In the thicket of thorn bushes, is his brooding mate. Not a sound escapes her as she sits cautiously watching the intruder.

The gate to the woods swings open, and I enter. A cow-path leads to the thicker growth and I follow it. Warb-

lers only a few I see, but I hear the thin, high-pitched notes of the yellow warblers as they flit about in the top of a thorny locust. A Maryland yellow throat sings from the thicket of underbrush. The common myrtle warbler is on duty cleaning up the leaves of a white oak. The yellow patches of his coat showing plainly; one on the crown, another on the rump, and one on either side of his breast. From a clump of isolated trees on the edge of the wood, I hear the Black-burnian's song. Like a miniature Baltimore oriole, his black and rich orange uniform attracts one's attention. His song, like others of his kind, is fine and rather shrill. "Tsee, tsee, tsee" he sings,—not sweet, but rather inspiring. A redstart flies across the trail. The rich salmon illuminating the shadows like a lightning bug that starts his fire in the darkness after sundown.

The calls of the woodfolk would lead me on and on into the very heart of the big woods, but duty calls and I must retrace my steps homeward. A vagabond am I, but one more secret of the wild is mine. When the call comes again, I shall heed it, for joy, peace and rest come from following it.

Trees and Friends.

BY GERTRUDE O. PALMER, LAWRENCE,
KANSAS.

"If thou art worn and hard beset

With sorrows that thou wouldst forget,
If thou wouldst read a lesson that will keep
Thy soul from fainting and thy soul from
sleep,

Go to the woods and hills!—No tears
Dim the sweet look that Nature wears."
Longfellow—"Sunrise on the Hills."

However lonely and far from home and friends we may be, we are never really friendless if we can have the companionship of a tree,—a full grown tree that has had a chance to express itself completely. As one approaches the shelter of the wide-spreading branches, he is conscious of a comforting presence, of a cordial welcome, which casts from him his care and worry and makes his spirit glad. The branches which beckoned at his approach, now in their swaying and rustling, murmur words of comfort and sympathy to him; they move about as if to make him comfortable and whisper in his ears words which he feels he alone can understand. There he can rest and gain

back strength and courage for the contest of life.

From his comfortable seat at the foot of the tree he looks out at the other trees of the woods and pastures, the hillside and the river-bank, seeing in their varying sizes and forms the characteristics of his many friends.

That small, rounded box-elder tree and its neighbor, the compact little quince, make him think of one or two comfortable, self-satisfied, materialistic friends of his whose thoughts and needs never transcend their circumscribed, limited range.

But out in the middle of the pasture stands a tall, wide-spreading oak, which speaks to him of another friend,—deep-natured, broad-sympathied, and high-minded, strong, symmetrical and noble.

Near-by, on the river-bank gracefully bending and swaying, is a weeping-willow, or rather in his mind's eye, that languid, artistic, dependent friend of his, no less dear to him than the tall great oak. Under its silvery tresses is offered a shelter more secluded and charming than under any other; a view of the world more softened and beautiful.

But far away on the hill-side, towers another tree, another friend, whose gift of comfort and shelter is not by protection but by a message of inspiration,—the tall and slender pine, like his mystic, aspiring, poetic friend. Indeed his willow speaks to him in poetic music, but in soft and gentle music of the heart, not like this one whose songs are sung from the cool, strong heights of the spirit. The true pine when given room to grow, offers no broad reception hall at its feet, but spreads low, wide branches to the ground, forbidding the intimacy of the willow and the oak. When seeking its company, one pauses near it at a proper distance from its prickly-leaved branches, or lies in the shade behind it, listening in rapt meditation to the harp high up in its top,—to the lyric or ode of his friend who lives constantly in the higher life of things, or who if looking down sees the lower only from above. In the spicy scent of the cool, soft breezes that blow through the branches, one breathes of his atmosphere of inspiration of keen spiritual life; he indeed offers his gift of love, the highest of all

the others, the gift of aspiration for that which is purer and higher.

Thus do all the trees speak to one who can hear them, thus do they represent the spirits and company of his own far-away friends, thus do they each bestow upon him their tokens of friendship, and he returns to his labors with a shining face, radiating the peace and power of one who has not been friendless or alone.

How Flowers Work, and What They Do.

BY HERBERT W. FAULKNER, WASHINGTON, CONNECTICUT.

As the spring has really come at last, we will begin our excursions in search of our old friends, the wild flowers, and

see what new acquaintances we can make this season.

But in order to make our studies truly profitable we must not be satisfied merely to know what the flowers *are*, but must also at the same time try to find out what they *do*. Flowers are not merely beautiful living creatures; they are also exquisite and wonderful mechanisms whose workings are most interesting. Their mechanisms are for the making of seeds or for their distribution. Now in the making of seeds two substances must combine. Just as in chemistry two chemical substances must combine to form a crystal, so in botany two vegetable substances, the pollen and the ovule, must combine to form a seed which shall live and grow. The pollen, as we all know, is a yellow powder, and the ovule is like a little green bead. The pollen is produced by little bags or anthers on a long, slender filament; the two being the "stamen." The ovule is formed and concealed in a green vase, the "pistil," with a long neck, the "style," opening at the top in the "stigma."

The pollen is carried from the anthers to the stigma by various agencies, such as the wind, the bees and the birds, but it has been found that it is better for the race of plants to have the pollen carried from the anthers of one flower to the stigma of another, for this makes the young seedlings more robust and better able to fight the struggle for existence. This shifting of the pollen from flower to flower is known as cross-fertilization, or cross-pollination, and Dame Nature takes the greatest pains to make sure that the pollen is crossed. She invents the most ingenious mechanisms for the purpose, employs insects of every variety, lures them with every charm of color, odor and nectar, and takes advantage of each one of their peculiar habits and tricks to make them work for the good of the flowers. But there are very few books which tell us anything about the strange mechanisms of flowers and the habits of the insects which visit them.

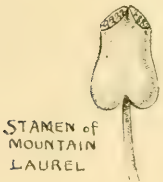
The botanics seem to confine themselves to the mere recognizing and classifying of our flowers, treating them as specimens, not as living creatures, with schemes and ambitions. Yet the subject is so full of interest that I hope my readers will accompany me in many excursions this summer and will question a host of our native flowers as to those



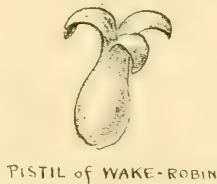
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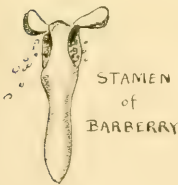
STAMENS & PISTIL of
SWAMP ROSE MALLOW



STAMEN of
MOUNTAIN
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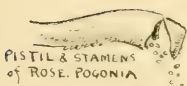
PISTIL of WAKE-ROBIN



STAMEN
of
BARBERRY



PISTIL of WILD IRIS



PISTIL & STAMENS
of ROSE POGONIA



PISTIL of PITCHER PLANT



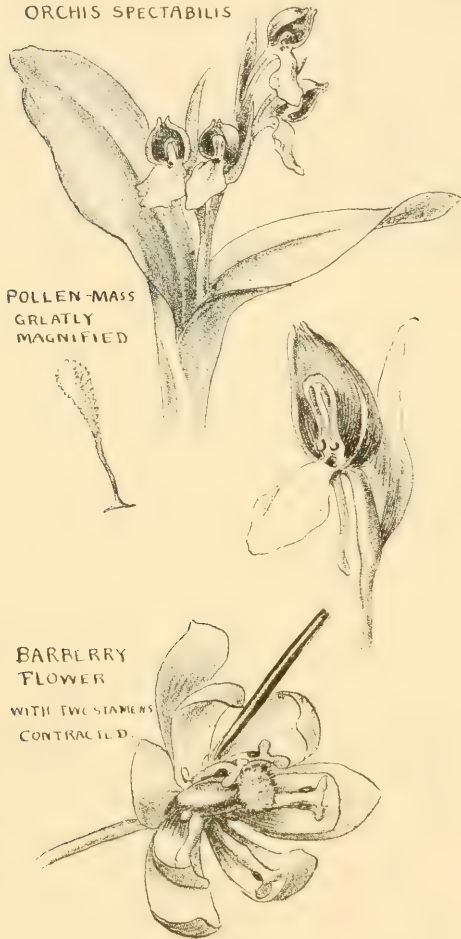
STAMEN of
Bouncing
BET



STAMENS &
PISTIL of
PINK LADY'S
SLIPPER

schemes and ambitions and try to find out the secrets of their lives.

It is always fun to collect something, such as stamps, coins, postcards or dried flowers. But let us begin a new kind of collection—one composed of the mechan-



ism of the flowers. This will consist of sketches of the various parts, showing how they work, and before the season is over we shall have a line of inventions and discoveries to rival the Patent Office. We shall find the stamens and pistils of our plants exhibiting extraordinary variety and modifications, and will discover that each grotesque twist and distortion of these organs is to help along the main purpose of the cross-fertilization of the flower

In the sketches here given will be seen several stamens and pistils of quaint and odd forms. In May you will find several flowers which bear their pollen on one

plant and form their seeds on the other. Gather and examine some jack-in-the-pulpits and you will find minute pistillate flowers on the "clapper" of one bell and staminate flowers upon another. The jack which makes the pollen fades before the season is far advanced, while the pistillate flowers develop into gorgeous bunches of red berries.

Examine the barberry flower with a strong magnifying glass and you will find it to be arranged like a minute sea anemone. Gently introduce the point of a pin into the cup of the flower and you will observe the spreading stamens curl toward the center as if alive and they will shed their pollen on your pin as they would do upon a bee's head. This barberry flower is a veritable sensitive plant and thus sends its charge of pollen away to another flower upon the furry coat of a faithful messenger.

In May, too, we have the showy orchis whose lovely blossoms with purple hoods and white bibs suggest the head of a monk with his cowl. Here the pollen is in the form of two clubs, and these are found in two small pockets where they can attach themselves to the head of an insect visitor. You can "play the bee" by using the point of a match or a pencil and can withdraw the pollen masses from their pockets just as the insect does.

Next month we will take up in greater detail the ways and means of cross-fertilization of the flowers, and study their insect friends as well.

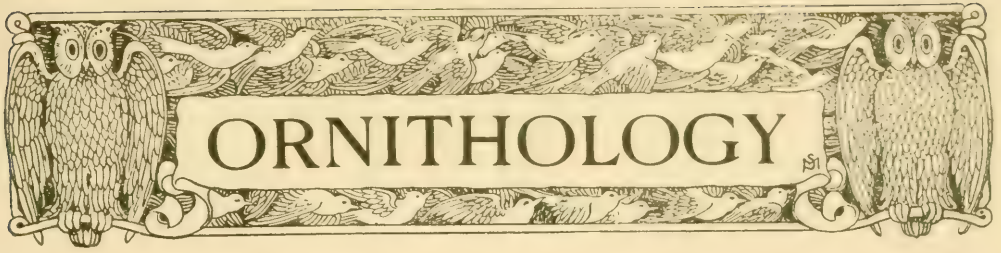
The roots of forest trees begin to grow in April and continue up to winter until the soil becomes too cold. During dry summers, there may be as much as five weeks of resting period when no growth occurs.

A single bullfrog, *Rana catesbiana*, is reported by a correspondent of "Science" to have been seen to stalk and devour five black swallowtail butterflies within a half-hour. As the insects hovered about the bank, the frog left the water, crawled toward its prey, covered the last foot of distance with a single jump and caught the butterfly in its mouth. The observation is claimed to be unique.

In coronation robes

The sunset clothes our heights,
And the moon with them doth share
The splendor of her nights.

—Emma Peirce.



All communications for this department should be sent to the Department Editor, Mr. Harry G. Higbee, 13 Austin Street, Hyde Park, Massachusetts. Items, articles and photographs in this department not otherwise credited are by the Department Editor

Our Distinguished Visitors from the Northwest.

From the western part of the great province of Alberta,—the home of the evening grosbeak in the Canadian Northwest,—to the little group of our

being set off by the conspicuous wings of black with a large patch of white, and a black tail. On the top of the head is a black patch nearly surrounded by a broad yellow band which runs just over the dark hazel eye and across the forehead; while the large, thick bill is pinkish-white. The general colors of the female are soft grayish-brown, with greenish-yellow about the neck and shoulders, and faint darker streaks on the back and top of the head. Their black wings



FEEDING ON THE DRIED FRUIT OF THE JAPANESE CRAB.

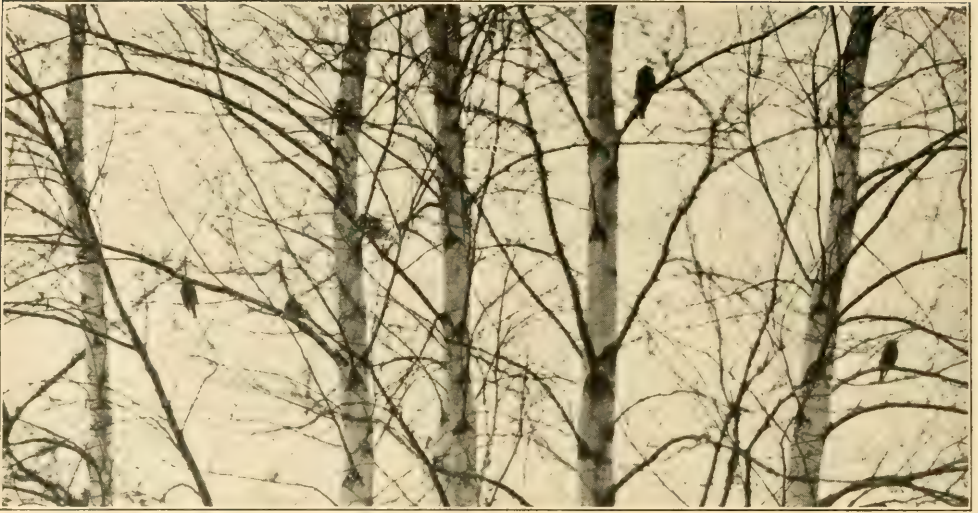
New England states on the Atlantic coast is about three thousand miles, yet now and then these beautiful birds, which but rarely visit the United States except in winter, wander in small flocks to our shores, to the delight of bird-lovers wherever they may appear.

The evening grosbeak,—about the size and build of our well-known rose-breasted grosbeak,—is a strikingly handsome species;—the general markings of the male being a bright yellow on the shoulders, sides, rump and belly; shading to yellowish-brown on the breast, throat and back; these colors

and tail are conspicuously marked with white spots and blotches, and the bill shows a decided tint of greenish-yellow.

During the past winter an exceptional number of these birds have been reported in the eastern states, although with the exception of the notable flights of 1890 and 1911, but few specimens have been previously reported from this part of the country.

Lexington, Beverly, Brookline, Milton, West Roxbury, Boston, Leominster and Lancaster are some of the places where small flocks have been



EVENING GROSBEAKS AT REST AMONG THE PIRCHES.

seen this winter in Massachusetts. Meriden, N. H., had a flock of thirty; Lebanon, thirty-six, while Concord, Nashua, Woodsville and Hanover were also visited. We have received reports of these birds from Port Chester, N. Y., Bennington, Vermont and Westbrook, Maine, and it will doubtless be found that the invasion has covered a much more extended area than here mentioned.

The beauty of these birds; their apparent fearlessness of man, and their regular visitations to certain feeding grounds, have made them objects of special attraction wherever they have become known.



"SECURELY CAUGHT IN THE STRONG MESH."

The accompanying photographs were taken by the writer at Lexington, Massachusetts, where pilgrimages were made to study the small flock visiting that town.

Here a flock of six birds came regularly about eight o'clock in the morning to feed upon the dried apples of a Japanese crab; this tree being abundantly laden with the small cherry-like fruit which remains in clusters attached to the twigs throughout the winter. They were reported as feeding previously upon the clinging seeds of an ash-leaved maple nearby, and after having practically stripped this tree of its seeds, they resorted to the crab. I also observed them later feeding on berries of the poison ivy; upon birch seeds, and upon the pits, or stones of wild cherry. These pits, they would turn in their powerful bills until they were placed just right, when they would easily crack them open, rejecting the hard outer shells and eating the soft inner pulp.

Their manners in feeding and moving about were leisurely, and they seemed to pay no attention to observers a few yards away. No notes were heard from these birds while feeding, but in each instance, just before taking flight, a low, chirping call was given by one of the males; then answered by the others, when they would suddenly all take wing at once, flying in a compact flock, with a strong, slightly undulating flight.

While at rest in the birches, these birds would occasionally utter a soft warble, similar to that of the purple finch.

As the birds flew from this grove, an unusual incident occurred which nearly resulted in the death of one of the fine males. A high, chicken-wire fence nearby was evidently not seen, and this bird, flying violently against the wire about eight feet from the ground, became so securely caught in the strong mesh, with its head and part of one wing through the wire, that it it could not move either way. Releasing the unfortunate bird, I had the pleasure of holding this beautiful specimen in my hand and closely examining it, and also of finding that it was able to fly; learning later that it had joined its fellows and was observed with them daily, suffering only the loss of a good many of its fine feathers.

Several evening grosbeaks have been reported to have been caught by cats, and a number of the flocks have somewhat diminished in number since first observed. It is probable that their natural environment in the great north west has caused them to be fearless of man and his civilized surroundings, and that they have yet to learn that "eternal vigilance is the price of life,"—especially for beautiful, forest-bred creatures when they visit our city yards and suburban waysides.

Bird-Fishers.

BY H. STUART DOVE, M. R. A. O. U. MEMBER TAS. FIELD NAT. CLUB, WEST DEVONPORT, TASMANIA.

The other afternoon I was watching some crested terns (*Sterna bergii*, Licht.) taking fish from the waters of Bass Strait, which divide Tasmania from Australia. The birds were evidently following up small fry, for they dived only a short distance out from the beach, in the shallow water just behind a breaking wave. One of them seemed much more expert than his fellows, for he would go in half a dozen times in five minutes, and apparently secure his prey each time: the others, perhaps only once in three or four minutes.

Nothing could be more graceful than the evolutions of these "sea-swallows" with long wings and forked tails, twisting and turning as they made their descent as if following every movement of the fish which was marked for their own

One would frequently take up his station just opposite where I was sitting, and hover, kestrel-like, with rapidly vibrating wings, at a height of about twenty to twenty-five feet above the water; the black-capped head bent down, the eyes searching for prey beneath. When head-on in this way he reminded me of nothing so much as a gigantic hummingbird hawk-moth hovering in front of a bunch of blossoms.

Several seasons ago I was privileged to witness a wonderful spectacle in the invasion of these waters by thousands of large gannets (*Sula australia*, Gould). Although I have repeatedly watched these fine birds diving off the coast of New South Wales and elsewhere, yet I never remember seeing them in such great numbers as on this occasion.

There is a quiet stretch of sea water resembling a large lake just to the east of Devonport breakwater, by which it is sheltered from the prevailing "westerlies." Into this, on a fine afternoon, the gannets would tumble by dozens and scores from a good height in the air, reminding the observer of a huge shower of snowflakes as the beautiful white plumage glistened in the sun's rays. It was marvellous how they avoided striking each other when they descended in such numbers and with such velocity,—each apparently oblivious of everything except that one small object which it had sighted beneath the surface. The greater the depth, the higher does the bird ascend in order to gain sufficient impetus to reach his prey. The descent is a literal "header," the gannet usually entering the waves nearly vertically, and with a distinct splash; a perceptible interval elapsing before he reappears some little distance away, giving his yellowish beak a twist backwards and forwards after swallowing his prey.

The gannet usually sits for a few seconds upon the water before taking another turn aloft, thus differing from the tern, which takes to its wings the moment it reaches the surface. When diving in shallow water close to the rocks, the gannet begins its descent from a height of ten or twelve feet only. In making the dive the wings are not closed, as is usually supposed, at the beginning of the descent, but remain expanded until the bird is close to the surface, and apparently assist in guiding it to the exact spot. It then claps them suddenly to the side of

the body, and the admirable adaptability of its shape to the aquatic life may be well seen just as it enters the water—the long beak, head, neck and body stretched out rigidly in one straight line; the legs and wings tucked closely in—everything arranged so as to offer as little resistance to the water as possible. Few prettier sights can be imagined than a company thus engaged in diving on a fine spring afternoon,—the bright sunshine above and the blue waters of the Strait beneath.

In the case of the terns, the dive is a much smaller affair, the birds not entering the water to any depth, and in some cases only half submerging itself. It rises immediately on the wing again, and the prey must be swallowed directly it is seized, for I have not been able to see anything held in the beak. Thus it differs from another "bird-fisher," the cormorant, which usually comes to the surface and adjusts its captive to a comfortable position for swallowing. On a river near Table Cape, on this coast, I saw a cormorant rise to the surface with a small flounder held in its beak, which it made vigorous attempts to gulp down, but in vain: it then flew to a tree some distance away, where doubtless the unfortunate captive was soon battered into a more convenient shape.

Bird-Lore's Christmas Census.

The sixteenth annual bird-census conducted by "Bird-Lore" was taken as usual at the Christmas season, and its results published in the January-February number of that magazine. A summary of the one hundred and sixty-four reports there given shows the general scarcity of winter residents or irregular visitants coming from the north, while many birds expected to be farther south have spent the winter in localities that would seem to indicate that the climatic conditions had little to do with their movements.

New Jersey and Pennsylvania seem to be about the northern winter range of the bluebird. Flickers, song sparrows, myrtle warblers, robins and meadowlarks appear to be wintering throughout our north-eastern states in greater numbers than formerly. Starlings seem to be extending their range, though most abundantly reported from New York and New Jersey. Cardinals were reported from many places; two as far north as London, Ontario. Wolfville, N. S., reported a vesper sparrow.

A catbird, a kingfisher and a Carolina wren were reported from Long Island, N. Y.

A single flock of two thousand cowbirds were seen in Nashville, Tenn. Crows, though comparatively scarce in the northern states, were reported in large numbers in the middle southern states,—showing a slight migratory movement. Five thousand were reported by one observer from Culpeper, Va. Very few bobwhites were reported in any of the lists. Millbrook Ontario, reported thirty red-polls, and a few others were reported from Connecticut.

A party from Los Angeles, California, reports the largest number of birds seen in a single day,—numbering 9,131 individuals, representing 121 species. The observing party was divided into eight sections. One hundred and sixteen species were reported from Santa Barbara, California.

One of the most interesting lists was that of Dr. Winsor M. Tyler, of Lexington, Mass., who, with two others, observed thirty-two species, numbering 1,188 individuals at Wareham, Mass. This list includes eleven bluebirds, twenty song sparrows, two pine warblers, twenty-four meadowlarks, three vesper sparrows, two savanna sparrows and a kingfisher.

Migrations of the Bobolink.

The bobolink, being a lover of damp meadows, has for many thousand years been shut off from our Pacific States by the barrier of the arid lands. At the present time, however, the progress of irrigation has established fertile spots throughout the region by way of which the birds can cross. Small colonies, therefore, are beginning to nest each summer on the western side of the dry country almost to the coast of the Pacific.

Apparently, however, the birds continue to migrate by their old route, going first north on their former track and then turning west, instead of cutting straight across by the nearest way.

Oh mountains vast and high,
That touch the blue of sky,

Thy battlements, so stern and cold,
The setting sun has turned to gold,
Now with his glory vie.

—Emma Peirce.

A Study of the Louisiana Water Thrush.

BY IDA E. EICHHORN, BARNESVILLE, OHIO.
(Photograph by C. C. Steele.)

Last summer we had a splendid opportunity for studying among picturesque surroundings, the home life of this wild, thrush-like bird, where a cool stream helps to make an ideal location. It wades



A YOUNG LOUISIANA WATER THRUSH SOON AFTER LEAVING THE NEST.

about in the shallow water in search of food and seems to have some of the traits of sandpipers, especially the habit of "tipping up," and making serious bows, very much emphasized by pert, little calls of "chink!" The male bird flies up and down the glen every ten or fifteen minutes, giving his familiar call as he dashes back and forth.

One beautiful morning in May, we were watching and waiting for birds, when suddenly a bird flew up on a fence post and sang a song, wild and clear, but sweet. Going closer we saw four or five more birds of the same kind wading about getting an early breakfast. One pair of them decided to locate their home on the bank of this pretty stream, giving us an unusual opportunity to study them.

Wandering down the stream one day, we suspected from the actions of this pair,

that we were in the vicinity of their nest. We searched, but in vain. If we went up stream they went down; when we went down, they darted through the bushes and we would hear their "chink! chink!" behind us, and see them standing in the water, bowing us a polite but most emphatic good-bye. The next day we returned and hid in a clump of high weeds, but neither of the birds seemed to be at home. Suddenly we heard the now familiar call of "chink! chink!" We remained very quiet and motionless, and were rewarded by hearing a chorus of little fellows calling lustily for their lunch. After the parent birds had flown down the glen again we started to search where we thought the nest must be, but what a hunt it was, for by this time the young birds had heard us and were as still as mice. Finally we found the nest under an overhanging bank of the stream. It was a rounded-out place, lined with grasses and leaves, and contained five almost grown birds. The day before we had passed it a dozen times and had stood on the path not a yard above it.

We could not return for several days because of the heavy rains. On Decoration Day the rain ceased and we went back, but the birds had flown. However, we pulled away the overhanging grasses and photographed the nest. Mr. Dawson in his "Birds of Ohio," makes the statement, "There be those who claim to know the nest of the Louisiana water thrush, but the author is not one of them." So we wanted some proof of actually having found the nest.

By the time the photograph of the nest was secured the parents had returned and by their conduct we decided that the little birds were very near. After searching we found only two of them and by this time the old birds were frantic with fear. They tried to draw us away by feigning broken wings, flying down the stream dragging their tail and wings in the water, and making pitiful calls and pleadings.

One young bird we found perched on a branch, on a very steep bank. After the camera had been placed near this bird, as the other one was not in a desirable location, the mother bird changed her tactics, and darted up the bank, endeavoring to brush the little bird off the branch with her wing; then she flew up into the woods dragging her apparently broken

wing, and returned in a few minutes to start all over again.

After cutting down some saplings we finally succeeded in taking the little fellow's first photograph, and how nicely and patiently he posed, for we about an hour obtaining it.

We are looking forward to the return of the water thrushes this spring, when we shall surely observe and study their interesting habits even more closely than we did last year. We wonder if this bird will be among them, or if he will make his home near some other little stream.

The Whippoorwill.

BY EDWIN L. JACK, PORTLAND, MAINE.

That the whippoorwill is of nocturnal habits and is provided with a wonderful plumage of protective coloring and has a love for the more solitary woodlands, are the three main reasons why so few

brooding, so closely does the whippoorwill cling to her eggs, and so much does she resemble a dead snag on the ground, that a person may frequently approach within four or five feet before discovering her. When the bird does leave her eggs it is done so quickly and quietly as to be almost uncanny. Like a shadow and without a sound she rises into the air on a pair of swallow-like wings and vanishes among the foliage.

The whippoorwill makes no attempt at nest building, a slight depression on the ground, on an old log or rock, serving as a receptacle for the two creamy eggs which are thickly speckled with brown, relying on her own protective coloring to shield them from danger.

A peculiarity of the whippoorwill in rearing her young is that if the nest is discovered the parent birds will move the young to another location even when only a few days old. The young birds here



NEST AND EGGS OF WHIPPOORWILL.

people are acquainted with the birds.

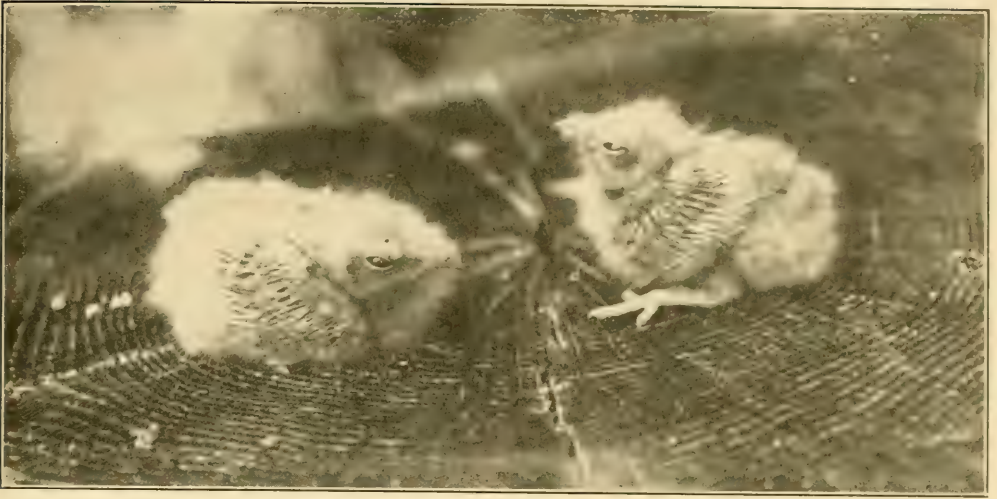
Throughout the day they remain hidden in the seclusion of the deep woods, but as the sun sinks toward the horizon, when the hermit thrush, that incomparable songster of the woodlands, mounts his choir loft and chants his vespers song, when the day is slowly fading into the mystery and tranquillity of an evening late in June, then the whippoorwill begins his activities. Flying on swift wings, he goes sailing over the lowlands in his search for insects which he catches in his gaping mouth, and as he rests sends forth his weird cry, "whip-poor-will, whip-poor-will, whip-poor-will."

If confronted in the daytime while

illustrated, when only five days old, were found at least eight feet from the original location of their nest.

Young whippoorwills are a light tan color and remain in the downy stage for some time before the pinfeathers develop. They have queer little feet which appear to be weak, for these birds never light on a small limb to which they would be obliged to cling. A wide limb or rock, or frequently the ground itself, serves as a resting place.

The whippoorwill is often mistaken for the nighthawk which it resembles in many ways, but may be distinguished by the three outside tail feathers which are white.



YOUNG WHIPPOORWILLS SIX DAYS OLD.
(See previous page).

A Humming Bird's Nest.

BY KATE M. ROADS, HILLSBORO, OHIO.

The brilliant plumage combined with the diminutive size and agility makes the "ruby-throat," one of our most charming and interesting summer visitors.

Motion is always associated with them, but close observation shows that they frequently rest, and especially is this true at the nesting season.

A single individual before a bright blossom holds our undivided attention;

but one sunshiny afternoon it was kept at its highest pitch by watching several pairs of these bewitching fairies as they dipped their slender bills into the spurred petals of the luxuriant *Aquilegia* which jutted out from every crevice and cranny of the "Niagaran" limestone which forms the steep hillside.

As the males flitted from flower to flower the metallic ruby-red throat sparkled like a gem in the dazzling sunlight.

The discovery of a nest on June 24,



WE OFTEN HEAR THE WHIPPOORWILL BUT SEE THE NIGHTHAWK.

1912, was due perhaps as much to the nest itself as to the excited and irritable movements of the birds, not more than fifteen feet away.

Frequent visits had been made and their actions observed by several persons, but all had failed to discern their purpose until after the nest had been completed and the eggs deposited. About ten feet from the ground, a lichen adorned nest was "saddled" on top of a small "lichen-less" maple limb where two small twigs projected,—one on either side. This wonderful bit of bird architecture was made of plant down "delicately woven with very small fibers" into a downy, flexible cup-shaped nest. Notwithstanding its flexibility, it retained its shape until after the young had flown. It was ornamented externally by bits of overlapping lichens. Its outside diameter was one and one-half inches and the inside diameter one inch at the top; the outside height being one and three-eighth inches and the inside height, three-fourths of an inch.

The other birds were determined to destroy this home, but the mother's agility and formidable weapon, her bill, served her well, putting to flight in one day a robin, flicker and blue jay. The quick fiery temper of the parents was shown best after the advent of the young when they would attack anything.

When the nest was approached the mother bird would fly off; perch upon a near-by limb, and when she thought she was unobserved would slide on with a swift gliding movement.

At their first flight they left us to return no more.

A Village Bird Warden.

The New England town of Dover, Mass., has the first bird warden ever appointed by a municipality in the United States. During the two years he has been in office there has been a very noticeable increase in the number of birds in that section. At the time when the warden was appointed the townspeople were asked to co-operate with him by allowing their land to be posted against gunners, trappers, and snarers; by reporting the presence of red squirrels; also reporting stray, wild or unowned cats. The people were urged to erect bird houses and feeding boxes.

The bird warden erected a large

number of bird houses at the edge of the woods and swamps and around fields and orchards and placed them through the village near dwelling houses. During the winter feed boxes with grain and suet were provided. Several hundred "No Hunting" signs were erected with most satisfactory results. A tract of 1,000 acres of land, located near Dover and owned by Mr. Richard W. Hale, of Boston, has been set aside as a State bird sanctuary.—National Humane Review.

Attention!

Meriden, Conn.

To the Editor:

In these days of general distribution of useful knowledge and advice through publications, nothing else than the indifference of the people is responsible for great changes in the wild life and vegetation, which we now have great reason to regret. The change may be first made by accident, for personal gain regardless of results to others, or as an experiment, but it is the indifference of the people that is responsible for not correcting by personal effort and legislative action any disastrous change while there is yet time.

Foreign insects and weeds are robbing our vegetation of its foliage and food. Corporations have built dams, and cities are emptying sewerage into public rivers, which has resulted in a public loss of the Atlantic salmon, sturgeon, alewives and a large part of the shad. The English sparrow has spread over the continent, and the starling is about to do the same, all because of the indifference of the people—many members of The Agassiz Association included. This is an unpleasant announcement, but who can deny its truth?

In the February issue of *THE GUIDE TO NATURE* I asked for witnesses who would testify either for or against the English starling in America by writing to me an account of their losses or benefits by reason of these birds. This would mean an expense of about three cents for postage and paper, and not over fifteen minutes' time. I do not know the circulation of your magazine, or the number of Agassiz students who study it thoroughly, but of the hundreds who probably read my article I have received but two answers. Both are pathetic appeals, from different states, to save our native birds from these invaders, and indorse my own observa-

tions that the bluebird and woodpeckers are doomed unless action is taken against the starling.

I believe that the cause of the great indifference of the people in these subjects of national importance is that nature study is not playing a sufficiently important part in our educational systems, even including the high schools. The great bulk of our eastern population is interested in the pursuit of the almighty dollar through mechanical industries, but a greater proportion of the rising generation must be interested mainly in a happy and healthful life, in the production, from natural resources, of their daily bread, or there will always be war.

My appeal is for your assistance to save our native birds from the invading starling.

LESTER W. SMITH.

Unfortunately many who claim an interest in nature have no vital interest which stirs them to action. They are only superficially interested and do not care to make any effort in this great work. They want the work done and are often loud in their praises, but they will not exert themselves to share in it, much as it may affect them or their future living. An amount equal to more than ten dollars for every man, woman and child in the United States and its possessions is the annual loss by destructive insects to our agriculture, yet how many bestir themselves to any serious consideration of this fact and that bird conservation and proper laws would eliminate a large part of such loss?

Our magazine has a present circulation of about three thousand copies, spread over the United States and some to foreign countries.

During the past six months an effort has been made to secure the help of ornithologists in making this department of lively interest and a practical help to our magazine. Considerable expenditure has been put upon it and Dr. Bigelow has been generous in allowing us space. We greatly appreciate the response from our contributors. We can increase our usefulness by having more items from a wider source. Original observation is what we want. Let us all help.

The "starling question" is by no means settled, and it is not yet too late to settle it. Notes covering a wide range by many observers are necessary to determine

practical results. Never mind what you *think* about the starling, but write Mr. Smith what you have *seen* and what you *know* about it.—And DO IT NOW.
—H. G. H.

Swifts and Weather.

West Devonport, Tasmania,
Australia.

To the Editor:—

Some notes under this heading appeared in *THE GUIDE TO NATURE* for August, 1915. On the evening of the twenty-fourth of February, 1916, a considerable flight of the spine-tailed swift was noticed from half past six until seven o'clock, the birds passing, not in a compact mass, but in a straggling way, as is their wont. I could detect them in the west, rising as it were from the horizon, coming gradually overhead, then passing away to east and southeast, feeding as they went, as could be observed by their movements. They flew at various heights, from thirty feet up to three or four hundred, and must have devoured large quantities of insects during their passage. Their appearance was coincident, as before, with atmospheric disturbance, a heavy thunderstorm having occurred on the previous day. On the afternoon of the day on which they were seen, heavy black clouds were visible to the westward, from which direction they came. By the papers next day we learned that a tremendous dampness had been experienced in that quarter.

H. STUART DOVE.

More Wrens' Nests of Wire.

Benton Harbor, Michigan.

To the Editor:

One of the first things that I noticed in your April number was the article on wrens' house furnishings of wire. For two years wrens have built in some bottle or dipper gourds of mine, also in a small box house, and in all cases the nest was mostly constructed of wire. I never read of a similar instance until your magazine came to hand. In the gourds a big handful of wire—staples much twisted wire (as from chicken fence netting), hairpins, nails two inches long and apparently as heavy as the birds themselves—also a little yarn that I had put out for them and a few twigs were used. It was suggested that the gourds were so

deep they needed a high foundation, but the bird box had the opening near the floor and yet nearly the same amount of wire was used. So I have almost decided that the birds use the wire for ventilation. The fact, however, is interesting and it is one house cleaning time in which I am much interested, to see what is inside of each wire nest.

GRACE H. POOLE.

Another Unusual Wren's Nest.

Meriden, Connecticut.

To the Editor:

In the April number of *THE GUIDE TO NATURE* the item entitled, "Wren's Nest Built of Wire," especially interested me as I had a somewhat similar builder upon my premises last summer.

Late in May a solitary house wren visited a small bird house that I had placed in a wild cherry tree, and after a careful examination began to carry in building material. Wrens had used this house the year before, and I had carefully cleaned it, hoping that they would lease it for another season. Consequently I watched with great satisfaction as the male sang his glad song and busied himself in constructing the nest. But his mate appeared to be missing.

For several days he worked about the place, but if he brought a prospective bride the home or the prospects could not have been satisfactory for the nest remained unoccupied.

In November the bird house was taken down and the nest building material was found to contain twenty-six pieces of rusty wire from poultry netting, three nails and two safety pins besides the usual supply of twigs.

If wrens continue to search for metallic building material, they will become the favorite birds of the junk dealers this summer.

LESTER W. SMITH.

Fearless Prairie Horned Larks.

Uniontown, Penna.

To the Editor:

About the middle of March, after most of the birds had returned from the South, we had a sudden cold snap accompanied by a heavy fall of snow and many of the birds were driven into the outskirts of the city in search of food. While returning home on the evening of the 15th, I noticed feeding

with the English sparrows in the street a pair of unusual birds, which I surmised to be a species of the horned lark. The male was light grayish in color, with black bands on the head and throat and a small tuft of black feathers on each side of the head, resembling horns. His mate was darker in color and lacked the horns.

Both birds were very tame and, when I stood motionless for a few minutes, they hopped up within three feet of me and seemed absolutely fearless. When a wagon or street-car passed, they would fly up with a little "tsee" and soon settle to feeding again. I do not know whether these birds are considered rare or not, but I have never before seen them in this vicinity.

ROBERT C. MILLER.

* * * * *

These birds were probably prairie horned larks, and while usually inhabiting old pastures and barrens, should not be uncommon in this general locality.—H. G. H.

Since the burning of the Dominion Parliament building, both branches of the Canadian legislature have had to be housed in the nearby Museum of the Geological Survey.

The Italian government has at length waked up to the long-standing crime of slaughtering song birds for food. A law went into effect on January first prohibiting the shooting of all song and insectivorous birds through the kingdom. Since Italy is in the path of the annual migrations, the results of this new legislation may prove far-reaching.

The remarkably warm January of this year in eastern United States had its counterpart in England. The records of the Greenwich Observatory, which are virtually complete for a century, show that the past January outdid the famous January of 1834 by a whole degree in average temperature, equalled the still more remarkable January of 1841, and has not been matched within two degrees in any year since. Five times, in England, in the last thirty years, Aprils have been colder than this January. In seventy-five years only two Decembers and one February have been as warm.



Animal Intelligence Again.

BY HENRY O. FALK OF SCRIPPS INSTITUTION FOR BIOLOGICAL RESEARCH OF THE UNIVERSITY OF CALIFORNIA.

[ILLUSTRATIONS BY STUART S. TABER].

I was mildly puzzled. I had seen flies, spiders, and moths in the house; occasionally also a flea, a sow-bug, or a centipede; but that crawling thing on the wall of our dining room looked like some shapeless parazoan. Closer attention showed that the focus of my

ingly perfect. The course they took is sketched in the accompanying diagram. I followed the progress of the work in mute wonder. Yes, I thought I discerned an underlying purpose. The ants did not choose the easiest way, nor did they wander about aimlessly. Quite the contrary. They heaved and tugged with a will, steering straight ahead for their destination despite obstacles and depressions. As the diagram shows, the trail followed was the shortest and most direct, although not the easiest.

Other ants scurried up and down the wall. Most of them paid little or no heed to the extraordinary labors of their neighbors. But now and then one of the wayfarers approached, and upon finding a vacant place somewhere on the edge of the cake, took hold and thereby incorporated itself into the gang. Thus the numbers swelled, each addition resulting in augmented effectiveness.

The affair sailed along smoothly enough until a corner of the ceiling was reached. Here is an aperture due to imperfect joining of the ceiling with the wall. Through this the ants came into the house, indicating the presence of a nest somewhere beyond, and here they dragged their precious burden. The diameter of the cake was easily twice or perhaps three times the width of the crack. My ants addressed themselves to the impossible task of pulling the cake through it. Retracing their steps a little, they crossed the mouth of the aperture, crept along one of its lips, then along the other, entered the crevice pulling the cake after them, or remained outside pushing the cake before them—all to no avail. For three hours the ants strove to deposit the cake in the aperture. I made observations at frequent intervals but the situation remained unchanged. The piece



"THIS 'LANGUAGE' IS SPOKEN WITHOUT EDUCATION."

interest was only a harmless piece of cake. Incredulity challenged sense experience. The walls of the room are dark brown, and what I am relating occurred in the evening; so conditions of place and time greatly assisted in the illusion, if they did not entirely produce it. A piece of cake, three-quarters of an inch by one-half an inch, was making steady progress up the wall.

I rose from the dinner table resolved to get more light on this singular event. Has the reader guessed or must I tell him that the motive power behind the cake was a dozen or so ants? The burden was many times larger and heavier than the combined size and weight of this self-constituted gang. Any working at cross-purposes would have been fatal to this social undertaking. But co-operation was seem-



"A PIECE OF CAKE . . . WAS MAKING STEADY
PROGRESS UP THE WALL."

THE CAKE GOES SAILING STRAIGHT UP.

"POOR LITTLE CREATURES, TO LOSE ALL
AFTER SO MUCH TOIL!"

of cake remained as large as ever, and the ants seemed as helpless as ever, though their labors were not a whit relaxed.

A child asked, "Why don't they break it and take it in piecemeal?" Ah, that question touches the crux of the problem. It marks the fork in the road, one prong leading to human behavior, the other to ant behavior. To carry the cake from the floor to the aperture was a great achievement requiring prolonged co-operative effort. But to get it beyond this called for a big dose of adaptive intelligence. Here was a brand new situation which had to be met in a brand new way. It was evidently necessary to reduce the cake to smaller units, small enough to permit their going through the narrow opening. A group of men would have gone right after this. But ant intelligence could not rise to the emergency. They knew only to be busy as ants, to imitate their more alert comrades, to work together, to drag and push, to try again, and over and over again.

I made my last observation at about ten o'clock. I had been out of the room for half an hour. Returning I turned on a light and mounted my observatory, a wooden box on a chair. I was not at attention more than two or three seconds when the ants loosened their hold and the cake toppled to the floor. Poor little creatures, to lose all after so much toil! Was it the sudden change of light, my breath, or both that induced them to drop their load? Did fatigue have anything to do with it? My impression is that I came too near and that they were suddenly alarmed on becoming aware of my breath. I permitted the cake to remain where it had fallen on the floor. The following morning it had disappeared.

At one time or another who has not watched the ceaseless, tireless labors of ants? And as he watched who has not marvelled at their feverish tasks performed almost always in comradeship? And as he marvelled who has not been tempted to explore the crypts of the animal mind? And as he explored, who has not asked questions which no biologist, no psychologist, no philosopher could answer certainly? The community life of ants, their endless toiling, the division of labor

among their fixed castes, and their cosmopolitan distribution, are all so suggestive of human society that their appeal to men's imagination is well nigh universal. Zoologist and layman, adult and child, are struck by many analogies with human life; all are charmed and interested though the avenue of approach is different in each case.

While we should avoid sinning with earlier observers in "humanizing the brute," (as Wasmann, eminent entomologist and Jesuit priest, happily phrases it) we must also avoid the opposite temptation to regard animals, even the most primitive ones, as mere chemicophysical automatons, capable of making only stereotyped "reactions" to outside contacts—much as a self-vending machine drops you a packet of gum, chocolate, or peanuts, depending on the slot chosen to insert the coin. This assumption is the outcome of a highly perfected laboratory technique, admirable in itself and in its results, but at best capable of getting only half the story. Abundant field study, that is, an examination of nature under natural conditions, should go hand in hand with experimentation, if we are to get anything like a fairly representative likeness of the animal mind. And still another instrument, often scorned by professional "behaviorists," and yet as fruitful and legitimate (if not as mathematically perfect) a means of canvassing the truth, is the use in scientific interpretation, of the humanly human qualities of sympathy and imagination.

By way of definition, it is enough for the needs of this article, to say that intelligence is ability to profit by personal experience and is brought into play for purely personal ends; while instinct is rooted in racial experience and is brought into play for racial ends. The daily life of ants is largely a chain of instinctive releases. Now and then, however, we run into something in their behavior which even the most skeptical must regard as intelligence. Indeed, this is a good place to review some of the evidence which supports this view.

Forel tells us that an ant may go far afield from its ruined nest. Chancing on a suitable spot for a new home, it will return and deport a fellow worker to the favored place. These two may

return for a second couplet, and ere long the migration becomes general. Forel concludes that when the first scouting ant undertook the carriage of

its fellow worker, it must have retained some sort of mental image of the place to which it was going. Likewise, slave-making ants will make a second



"SLAVE-MAKING ANTS WILL MAKE A SECOND ATTACK ON A PILLAGED NEST IF IT CONTAINS MORE OF THE COVETED YOUNG."

attack on a pillaged nest if it contains more of the coveted young, but if all the doomed slaves had been scooped up at the first onslaught, they will not go on the warpath again. That author demonstrated that sight and smell had nothing to do with attracting the warriors over the long distance separating them from the subjugated nest; so it must be due to memory of the remaining pupae. Wasmann discovered that when the pilfered pupae matured and became accustomed to their masters, they showed a pronounced hostility to their real brothers and sisters, if perchance these blood relations were encountered in the field. Friend and foe are attracted by odors which are learned by experience. It is not a hereditary or instinctive matter.

Further, such leading specialists as Forel, Wasmann, Wheeler, and McCook, recognizes a system of communication among ants. This "language" is spoken without education in any sense of the word. Various signs and signals are employed, such as postures, movements, and stridulation. Does anyone doubt that communication facilitates co-operation? Every mass-activity is started by a wide-awake individual. Nearby ants catch the bustle and imitate. Thus the job becomes contagious spreading like a conflagration in all directions, and ere long the entire community is at it. Apparent conflicts are due to simultaneous exertion of leadership in several directions. But these differences are trivial and ephemeral, being rapidly smoothed out. The work proceeds as "in a state of anarchistic socialism, each individual fulfilling the demands of social life without guide, overseer, or ruler."

Writings on animal behavior fall under two heads: professional and amateur. As a class the former are inclined to be conservative, attributing no mental power to an animal unless it can be certainly demonstrated. Amateur observations swing to the opposite extreme, the ultra-anthropomorphic view. They fancy the inter-play of human-like emotions, passions, ideas, wills, among animals. More than that, lacking the instrument of intelligent interpretation which comes from long continued study, they deduce from isolated observations unwarranted proofs of sagacity, even of prophetic

insight. Perhaps here as in most differences of opinion, a conciliatory course which nevertheless skirts the camp of expert judgment comes nearest the truth.

The Moth Market Exaggerated.

The responsibility of authors to their readers is illustrated in many ways. One illustration is afforded by the experience of the director of the American Museum of Natural History, which in the last few months has received many pathetic letters coming from all parts of the country, asking how the writers can sell moths and so get money to accomplish some desired object. One girl in a backwoods hamlet of Arkansas writes: "Please rite me how much you pay for moths. I want to make money to go to school." How did the idea of selling moths to the Museum occur to her? Professor Lutz explains: "In 'The Girl of the Limberlost,' written by Gene Stratton-Porter, we are told how a young girl with a strongly developed love of nature is able to make money enough to pay for her education and provide herself with the necessities of life by hunting rare specimens of moths, which she sells to a dealer who supplies museums and collectors. Soon after the book made its appearance letters like this began to come in,—only a few at first, but the number increased steadily. One pathetic letter was received from a woman who hoped she could sell enough rare moths to go to Denver to be cured of tuberculosis. So you see there is a tragic as well as an amusing side to all this correspondence. The author of 'The Girl of the Limberlost' sold Elnora's moths for four times what a wholesale dealer would pay even for perfect specimens. But hundreds of readers of the novel evidently have regarded her story in the sense of a report on the market for moths, and the letters still keep coming in."—The Writer.

The blue crab of our Atlantic coast becomes mature at three years and after that usually ceases to grow or moult. Before that time, the rate of growth and the interval between moults depend on the food supply.

TO KNOW THE STARRY HEAVENS

The Heavens in May.

BY PROFESSOR ERIC DOOLITTLE OF THE
UNIVERSITY OF PENNSYLVANIA.

The most conspicuous of our southern constellations now in the heavens is the beautiful Leo, now only a little way past the meridian and very high up in the south. The reader will have no difficulty in tracing out this beautiful star group, especially as no other

stars form an outline even faintly suggesting the object for which they are named.

* * * * *

The May Stars.

At the beginning of the month the planet Mars is just without the blade of the Sickle, but as the days go by this deeply reddish planet may easily be seen to be quite rapidly moving east-



Figure 1. The Constellations at 9 P. M., May 1. (If facing south hold the map upright. If facing east, hold East below. If facing west hold West below. If facing north hold the map inverted).

conspicuous stars are near it. Its first six stars form a very perfect outline of a Sickle; this portion forms the head and forepart of the Lion, the end of the tail being at A, Figure 1. This is one of the few constellations whose

ward, so that by May 20 it apparently forms an additional star to even more clearly mark out the handle, and on May 24 it will pass north of the bright star Regulus, at B. The two bright objects will then form an interesting

figure as they are seen shining together in the field of a small telescope.

Having become familiar with the important Leo, the observer should next turn farther eastward and trace the outlines of the very interesting summer group, Virgo, which extends from Leo almost all the way to the Scorpion, this last group is the brightest and most striking of all the summer constellations.

The groups, Leo and Virgo, are both of immense antiquity. Some astronomers believe that they were thus named at least fifteen thousand years ago when the Vernal Equinox was at V, Figure 1, and when as the sun passed through this region the Egyptian harvest occurred. Possibly the well-known Sphinx, which represents the Virgin's head on the Lion's body, commemorates the life-giving, annual inundation of the Nile, which occurs while the sun is passing through, first, the Lion, afterward, Virgo.

Virgo has been represented from the earliest times as a maiden bearing in her left hand a Spike of wheat (marked by the blue Spica at C, Figure 1) while on some of the very earliest zodiacs which have been preserved she holds in her right hand a distaff, formed of the beautiful filmy cloud of stars at D, known to us as the separate constellation of the Maiden's Hair.

The sun passes through Leo during August and early September and thus both groups, the Sickie and the Wheat-bearing Maiden, are very intimately associated with our harvest days. But Virgo alone is the reigning group of the late summer days:

"Virgin, august! come in thy regal state
With soft majestic grace and brow serene;
Though the fierce Lion's reign is overpast,
The summer's heat is all thine own as yet,
And all untouched thy robe of living green
By the rude fingers of the northern blast."

The legends connected with our star figures are usually interesting and often very beautiful. They also help us to realize how, for so very many centuries, men have looked upon and thought about the same beautiful constellations which shine in our heavens today. Thus in early Greek mythology Virgo was also a maiden who hanged herself in grief at the death of her father and who was placed in the sky with Bootes and Procyon as attendants.

The figure is the oldest purely allegorical representation of innocence and virtue.

And when the observer has traced out the very long and winding Water Snake (now in its best position for observation of the entire year) and the two little constellations of the Cup and the Crow above it, he is reminded of the legend of how the blackbird was sent for a cup of water by Phoebus

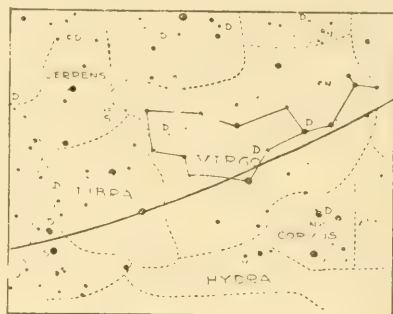


Figure 2. The region about Virgo. Each star marked D is a double star, while each star marked V is a variable. N indicates a nebula and S a star cluster. Many of these are beautiful objects in the telescope.

Apollo and returned after a long time with only a water snake in his mouth and attempted to deceive the god by false excuses. He was therefore condemned to remain always in the sky with a snake and an empty cup near-by as evidence of his guilt. Hydra, however, in far earlier times symbolized the winding courses of the moon, and on the Euphrates, three thousand years ago, it was identified with the source of the Fountains of the Great Deep.

* * * * *

Learning the Constellations.

Above Leo and Virgo, the reader will have but very little difficulty in tracing out the Great Bear, which now rides in the highest point of the heavens. The head and shoulders are at F, three of the paws are at E, and the long tail extends to D. Below this are the well-marked groups of Corona, Bootes and Hercules.

To trace out and become entirely familiar with these few constellations will take the observer but a short while on any pleasant, moonless, May evening. And having done this, he will have learned nearly half the area of the visible spring sky. To become familiar with all of the brighter stars is, in fact, far less difficult than is

thought by most people, two or three evenings' observation is all that is required, and this pleasurable study (aside from being most interesting and profitable in itself) is a most wise and

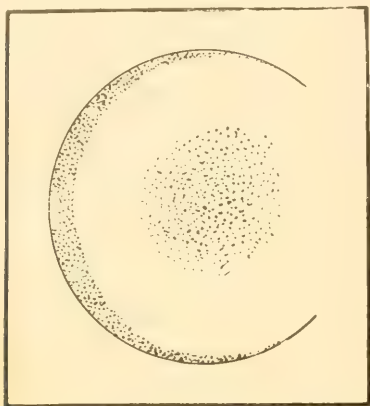


Figure 3. Appearance of the planet Venus when nearly between the Earth and Sun. The great prolongation of the horns and the very irregular termination show clearly that Venus has a dense atmosphere. The dim light on the ball of the planet is probably of an auroral nature.

preliminary preparation for a more detailed exploration of the heavens with a small telescope.

The Planets in May.

Mercury enters the evening sky on May 3, and on May 12 it reaches its greatest distance east of the sun. For a few days before and after this date it may easily be detected shining in the twilight glow for nearly two hours after sunset. It should be looked for in the northwest only a short distance above a point of the horizon which is a little farther toward the north than the point at which the sun was seen to set.

In the telescope it will be seen to be a beautiful little brightly shining world, its shape the same as that of the moon when half full. Having found it while it is in this most favorable position, the observer can follow it for several days and see it rapidly changing into a narrow crescent as it draws nearer the sun's rays. It will finally withdraw from the evening sky on June 3.

Venus is by far the brightest and most striking object now in the heavens. No one who turns toward the western sky in the early evening can fail to have his attention arrested by this exceedingly brilliant evening star. On May 1, it will be seen to occupy the position H, Figure 1, a little

to the east of the horns on the Bull, but as the weeks go by it will move rapidly eastward, almost crossing Gemini, until by May 31 it will attain the position K. This eastward motion, in which the planet has continued for so many months, will, however, soon cease. On June 11 the planet will reach the position M, and will then begin to run rapidly toward the west. It will finally pass to the right of the sun and leave the evening sky on July 3.

At present the planet is wonderfully brilliant and so high in the heavens that it sets far in the northwest so late as seven hours after sunset. It attains its greatest brilliance on May 27, at which time it will shine with no less than one hundred and twenty times the brightness of a first magnitude star.

No observer who possesses a small telescope should fail to study Venus from time to time during the present month. He will see its shape change rapidly to that of a narrow crescent, as more and more of the right side of the planet is turned toward us, and he may even at times detect the faint illuminations sometimes seen on this darkened hemisphere and which are probably caused by auroras in the night skies of our Sister World. He will also see that the line of division between the dark and the sunlit part of the planet is by no means a sharp line, but that it fades gradually in some places and is irregular in others. This is the twilight on Venus, and tells us clearly that this world is surrounded by a heavy atmosphere.

Venus in its eastward motion will pass Saturn on the forenoon of May 24; it will again pass Saturn—this time during its westward motion—on June 22. The approach of the two planets will be much closer at the latter conjunction than at the former one.

Mars is moving eastward into Leo and is still a conspicuous object in the heavens, though its distance away is now so great that it is not a very satisfactory object in the telescope.

Jupiter is in the morning sky, rising 1 hr. 10 min. before the sun on May 1, and 2 hrs. 30 min. before sunrise on May 31. It has not yet, however, sufficiently emerged from the sun's rays to be in very favorable position for observation.

Saturn is near the middle of the constellation Gemini, sufficiently high

above the ground to be very well viewed in the early evening. The rings are well opened out, and these with its brighter moons make it one of the most interesting of all objects in the telescope. This is the last month of the present year, however, during which Saturn can be satisfactorily observed in the early evening.

An Open Letter to Mr. Andrew Carnegie.

I have noted with much pleasure your interesting article in the March number of the "Woman's Home Companion" in which you say:

"What are among the best practical uses to which wealth may be put? Perhaps the most important of all is the founding of great universities. In connection with them should be observatories completely equipped for the study of astronomy, in order to carry further our knowledge of the universe and of our relation to it here upon earth. But as the need for establishing new institutions of universal learning perhaps no longer exists in this country, great good can be accomplished by adding to and extending the facilities of those already in existence."

More universities are undoubtedly needed to extend a knowledge of the things that are already known, but great observatories in connection with great universities will not accomplish that object. The university may increase and make knowledge popular, but the work of great observatories is to increase the sum of human knowledge of the heavens. A greater number of astronomical observatories in connection with a greater number of universities would be a juxtaposition of incongruous concepts, because the university teaches while the great observatory accumulates. You presumably have in mind a desire, perhaps the intention, to disseminate a knowledge of astronomical realms. There may be need of one great observatory in the East for the accumulating of more astronomical knowledge, but it is doubtful. What are really needed are less rigid financial facilities for the observatories that are already established; if that were accomplished the accumulation of a knowledge of facts astronomical would take care of itself.

But to disseminate knowledge an entirely different type of observatory is

needed, a large number of moderate sized observatories, so that one might be in every town and city of the United States. Here at Sound Beach, a small community but with easy access from the city of Stamford and the Borough of Greenwich, we have recently completed an observatory costing about \$1,300. This will do fairly well for this community, but the ideal observatory would be one that should cost some \$6,000 or \$7,000, possibly, in larger communities, \$10,000. I should not advise the town to go much beyond that, but I would put an enthusiastic man in charge and have him devote all his time to the task of showing the public what has already been discovered. He should have a lecture hall, and at least one assistant, so that when he is talking to visitors, and using lantern slides, he should have some one to manipulate the telescope. In smaller places the astronomer would probably not need an assistant. Let me suggest that the grandest and greatest thing that you could do in the most uplifting of sciences in the disseminating of knowledge among humanity would be to establish a series of such observatories, and to provide for their maintenance for, say, five years. Erect an observatory in each of ten places. This would cost as a total about \$50,000 for establishing, and perhaps \$12,000 a year for maintenance, or for five years \$50,000 to establish and \$60,000 to maintain. Could you invest \$110,000 to better advantage? The plan would prove practical, and, I am sure, you would consider it worth while to establish a series of such observatories near to leading centers, and to maintain them in perpetuity, or as you do with your famous libraries, arrange for the local community to provide a part or even all of the maintenance. There are, I believe, many places in which the observatory would be carried on locally if once established, but I am sure that it would be dangerous to establish such in connection with any college or any high school. The tendency would then be to use it merely for class work. As the teaching is now conducted in many of these places, that would take the heart out of the whole thing, and the pupils would soon detest the tiresome array of facts and figures.

You have accomplished great and wonderful results in establishing public libraries, but you never could have secured those results if you had established the libraries in connection with universities.



MR. AND MRS. ANDREW CARNEGIE

(Photograph by Paul Thompson.)

Here is a thoroughly efficient and successful business man who places an astronomical observatory only second in the list of "the best practical uses to which wealth may be put."

colleges, or even with high schools. Your libraries stand alone as the great educational factors in great communities. Establish observatories on exactly the same principles and you will achieve a similar success.

I note with much pleasure your assertion that your interest in libraries was awakened in you, because, as a boy in

Pittsburgh, you found it so difficult to gain access to books.

Although you consider the establishing of popular observatories as more important than that of libraries, you tell us that you have devoted your efforts to the libraries because of your own personal experience of the need. Please make a few inquiries to ascertain the astronomical

need. You will learn that in any community perhaps only one person in a thousand has ever looked through a telescope, that many people are craving a glimpse of the worlds in distant space. In no city in the country, except perhaps in Pittsburgh, can you find half a dozen boys or girls who have ever seen the inspiring planet, Saturn, or the wonderful Nebula of Orion.

Astronomy has suffered much at the hands of its friends, but judging from the rapidly increasing circulation of such publications as "The Monthly Evening Sky Map" and *THE GUIDE TO NATURE*, the science in popular estimation is coming into her own. As you put astronomy second in your list of educational philanthropy, I should feel almost sure that you hail from Pittsburgh, although I might not know the fact. Out there astronomy seems to be in the air. Recently the Allegheny Observatory was established by popular subscription at a cost of more than \$300,000, and that too within a very few weeks after Mr. John A. Brashear started the subscription paper. The largest gift, as I recall it was \$62,500, with others smaller, but including a large number of what may be called really popular contributions at \$5.00 each. A curious anomaly, isn't it, my dear Mr. Carnegie, that in a city with an atmosphere proverbially smoky, there should be so emphatic a manifestation of popular desire to study the heavens? No other place in the United States equals Pittsburgh in this particular; in no other place, I believe, has there been so great a manifestation of popular interest. We in the East seem to be so commercialized that such questions as have come to me during the establishing of our Sound Beach Observatory seem quite in accord with what is in the popular thought.

"How will it help young folks to earn a living?"

"There is nothing practical in it."

"You will develop only idle stargazers."

I am glad, Mr. Carnegie, to know that you are coming to Connecticut to live. We need you here. I think you will be the only wealthy man in the state or, indeed, in all New England, for that matter, who would put second in a list of public philanthropy the establishing of a public astronomical observatory. Some of our wealthy men, judging from my year's experience while soliciting contributions for the Sound Beach Astron-

omical Observatory, would not fail to leave astronomy out of the list. Allegheny and Pittsburgh raised \$300,000 within a few weeks. I have raised \$1,300 at an expense of an enormous amount of time, advertising, letter writing and persistent begging, working almost continuously for one year, and at the summing up I find that the gifts came all the way from Maine to California, but with less than half, or about \$533.85, from the State of Connecticut.

The question is often asked, "Why has no great observatory ever been established in the eastern United States?" Let such seekers after knowledge make the attempt to establish even a small observatory, and they will understand why. We need more astronomical interest here in the East.

Come over into Macedonia, Mr. Carnegie, and help us.

Beauty for the Star Gazers.

But let us turn from the sublime to dwell awhile on the aesthetic nature of the celestial vault. We feel a certain intrinsic loneliness while beholding these peerless jewels, of a distinctly individual character. I doubt if the sentiments of the lover of lake, mountain, or floral beauty are equal to those of the ardent star gazer. To one acquainted with the geography of the heavens, the first magnitude stars and the more impressive constellations assume the role of old friends. What a sense of security and comradeship it must give the sturdy arctic explorer when his way across the frozen wastes is brightened by the familiar rays of Vega or Capella! It is akin to the light that guided Leander when he swam the Hellespont.—Henry Handy McHenry in "Popular Astronomy."

Arcturus—Rising.

Again Arcturus beams!—his gleaming light
Burns brilliantly amidst the star-lit night,
Like harbinger in yonder eastern sky

He rises to proclaim that spring is nigh;
When winter's snow still lies on hill and
vale,

And winds of March first wander down
the dale,

Ere crocus blooms or falls mild April's rain,
Like beacon bright Arcturus beams again.

—Charles Nevers Holmes.

Newton, Mass.

41 Arlington St.

—Popular Astronomy

New Weather System Fallacious.

CHIEF OF U. S. WEATHER BUREAU WARNS
PUBLIC AGAINST LONG-RANGE WEATHER
FORECASTS.

Washington, D. C.—The chief of the U. S. Weather Bureau states that in the opinion of the bureau a new system of long-range weather forecasting, which has been widely discussed recently, was quite fallacious. The new system is said to be based on the spottedness of the sun and rifts and shafts of solar radiation. In the opinion of the Weather Bureau it belongs in the same class with other methods of long-range weather forecasting based on lunar, planetary, magnetic, and astrological considerations. None of these systems it is said, has any scientific value.

During the past few years the Weather Bureau has received full specifications concerning all the essential details of this particular system. The alleged discovery is, therefore, fully known to the Weather Bureau and has been carefully studied and examined by its scientific staff. Moreover, other scientists of international reputation now connected with the strongest institutions of the world engaged in astronomical research, and conducting investigations into solar and terrestrial physics, have also passed upon these new theories. These authorities are in accord that the deductions and conclusions drawn from the solar conditions on which the new system is based are unwarranted.

When the disc of the sun is minutely examined with powerful telescopes, or when it is photographed with the aid of the modern spectroheliograph, the surface presents a characteristic spotted appearance which undergoes slight changes from day to day, and greater changes with longer intervals of time, depending upon the well-known rotation of the sun upon its axis and the periodic recurrence of the sunspot maxima and minima. These and certain well-known related phenomena are now put forward as the basis of a new science which will make possible forecasts of the weather far in advance. That these features of solar activity, however, actually should control and determine the daily changes and sequence of weather conditions in any definite or direct and consequential manner, is regarded by the Govern-

ment scientists as quite impossible. Solar phenomena of the kind described do not have any direct influence upon the weather at any particular time and place, and can not be made the basis of any forecasts whatsoever.

The alleged discovery is regarded as only one of a number of similar schemes which are continually being put forward. In some cases the advocates of these schemes assert that they can forecast the weather for weeks or months in advance, and in others they state that they have found means of producing rain artificially, or preventing hail, and in other ways interfering with and controlling atmospheric phenomena. These pretensions meet with a certain credence because there are a number of people who still cling to the ancient belief in the influence of the moon on the growth and development of crops, and to the idea that the weather conditions depend upon planetary and astrological combinations. In consequence the Weather Bureau has been called upon from time to time to caution the general public against faith in these so-called discoveries.

The U. S. Weather Bureau itself is the authorized agency of the Government to collect meteorological observations and make and issue weather forecasts and warnings. Every important nation of the world has a similar organization and all use essentially the same methods. All of these organizations condemn and disprove the methods and theories of those who assert that they are able to predict the weather for any considerable period in advance.

Fair Nature's cup is full and running o'er,

A wealth of bursting bloom where'er we
go;

When treasures such as these are heaped
galore,

Let us be near to get the overflow.

—Emma Peirce.

The mountain streams of India have heretofore had for fish only the hardly edible barbel. Now, however, they are being stocked with the brown trout. These are sent to the Punjab from Kashmir where they have already been introduced. Rainbow trout are, in addition, being tried in the warmer rivers.



The Woodcraft Movement.

We extend hearty congratulations and best wishes to the managers of The Woodcraft League Movement founded in April, 1902, and recently taking on new life in their new headquarters at 13 West Twenty-ninth Street, New York City. The movement is primarily educational with outdoor activities. For its motto it has, "The Woods for the Children—the Children for the Woods."

The Council consists of many naturalists and educators, but we surmise that the chief work in behalf of the movement will be done by Ernest Thompson Seton, the well-known naturalist, artist and writer, assisted by Philip D. Fagans, his executive in charge of the New York headquarters, who has had extended experience in camps, especially in connection with Y. M. C. A. work.

In one aspect of this movement, The Agassiz Association especially is heartily interested and of it thoroughly approves: "It recognizes the beauty of Common Things."

The purpose of this organization is to show the thousand daily little things in the woods or in the town or in ourselves that focus the interest of all and add to the power of seeing, living, mastering and enjoying; ever remembering that manhood or womanhood in the fullest highest sense is the first aim to true education.

"To learn the ways of the Woodwise for their own sake, and the worth of what they offer those who hear—the understanding eye, "the thinking hand," the mind controlled, the body trained and fortified, so that one's lot wherever cast, in town or farm in high or low estate shall never lack the chiefest joy of life, the pleasant sense of some small triumph every day."

The Four Lacks.

1. Lack of simple pleasures.
2. Lack of reverence—respect, manners
3. Wastefulness—lack of thrift.
4. Lack of public responsibility—on part of individual. Granting that the most important thing in our country is the character of our young.

How The Woodcraft League Helps Meet Needs.

1. We aim to show boys and girls how to enjoy life without the mere spending of money—joy of beautiful things in everyday life. To offer a new kingdom in which every one may be a king of some small realm.
2. To help construct such an attitude of mind as to result in respect and reverence. To inculcate such an attitude as shall result in respect and reverence for others. People living up to small extent of capacity—our job to help realize possibilities—use of lung power.
3. To give every young person the opportunity to develop the love of outdoor life, the woods, and the wild things. In developing this love we work for their preservation—conservation—develop the habit of conservation broadly.

Remember that sentimental forrester has done as much for conservation as the commercial.

Young to be led rather than taught—show the thing that is there—for which they are already more than hungry.

4. By the Council Ring to develop the spirit of public responsibility and service.

Our Emphasis.

1. On the summer camp—the heart is the Council Ring.
2. We keep families together—dan-

ger of institutionalism—breaking up of family—our work for all ages—family interests and activities.

3. In the Woodcraft Work we emphasize the heart and mind as well as the body in daily life. Romance—picturesqueness—the poetic beauty—histrionic,—the arts.
4. We insist on boys and girls sharing in the discipline and government—under adult guidance which results in everyone taking part as subordinate and leader alternately.

Not fewer than 3,000 in definitely Woodcraft Camps last summer.

The rubbing stick fire now used country wide

For Universal Association.

Lower Lake, Lake County, California.
To the Editor:

I heartily endorse the motto expressed on page 340 of the March issue of *THE GUIDE TO NATURE* under the headline, "The Highest Ideals," in the words, "Live and help live . . . All the world should be an Association."

Is not this huge ball under our feet one great home of Man? Is not our life on this cosmical body our true "state" (derived from the Latin "stare," which means "to stand on")?

Is there a stronger organization than the physical union of all nations and races of men by the gravitational pull of one and the same planet, by the chemical action of the inhaled oxygen of one and the same atmosphere, by the dependence upon one and the same sun as the only source of human energy.

How artificial and superficial are all those petty boundary lines and fences that an exaggerated nationalism, with a one day's life, has created in the realm of human feeling, if seen against the background of those powerful cosmical conditions that have evolved in countless millions of years and will last through other millions of years.

Dear Old Mother Earth seems to me to be our natural, God given Empire; and harmony, justice and freedom for all men, not hegemony or undue privileges for any special groups of men, appear as the desirable political ideals.

I can imagine no greater tragedy than the present European War at a time when our technical achievements showed an irresistible tendency to organize the whole

human population of our planet into one great unit. Whilst railroads, steamships, telegraphs, wireless communication, airships, etc., have practically changed our earth into one village with common interests, the peoples living in the different houses of this village have cherished incendiary and hostile feelings for one another, missing the proper mental change adapted to the changed technical "milieu" and thus becoming more and more unfit for further coexistence.

The principles of the "survival of the fittest" seems categorically to demand an essential correction in modern nationalism.

Differentiation and harmony must wed each other to secure a happy life.

Yours very truly,

L. SCHWIERS.

Death of an Esteemed Member.

Word reaches us of the death of our Member, Mr. A. Ramsay, 15 Lawn Crescent, Kew Gardens, Surrey, England, on March 3rd. Mr. Ramsay was a Sustaining Member of The Agassiz Association and took active interest in all phases of nature. He was one of the many real nature lovers who have ideally cooperated in the development of this Association, helping it to help others and being helped by it.

The Association extends heartfelt sympathy to the bereaved members of the family.

A Candy Sale for The Agassiz Association.

The Rogers School Chapter (Stamford, Connecticut) of The Agassiz Association recently held a candy sale to obtain money with which to buy a frame for their Charter. This sale was so successful that two dollars and a half more than was required for the direct purposes of the sale were obtained. That amount was contributed to the general work at ARCADIA in furthering the purposes of The Agassiz Association.

Parts of China which in the past have suffered severely from forest fires are adopting an effective scheme for the government reservations. The cleared fire lines, thirty to one hundred feet in width, are let to farmers and cultivated. Thus the fire lines are kept always bare ground or green crops too wet to burn.



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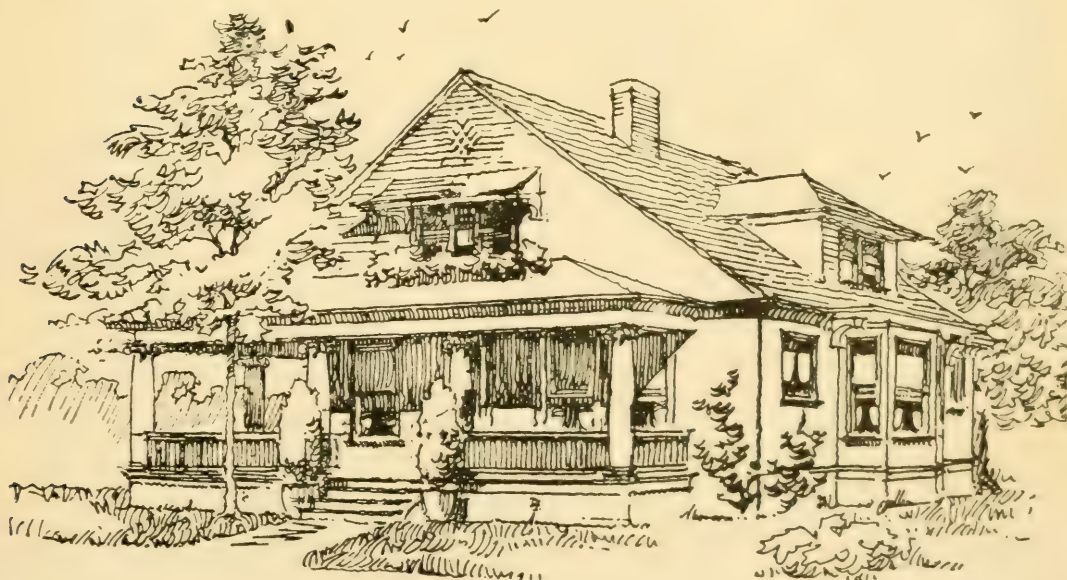
An Ideal Home.

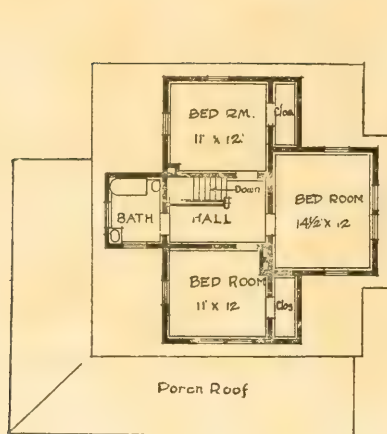
This suburban cottage embodies all the features that make a thoroughly satisfactory and pleasing dwelling. The large porch is especially enjoyable during the summer months.

The first floor consists of a large living room, dining room, den, breakfast room and kitchen. The broad fireplace, and wide open staircase make the living room a charming room. Three bedrooms and bathroom are on the second floor.

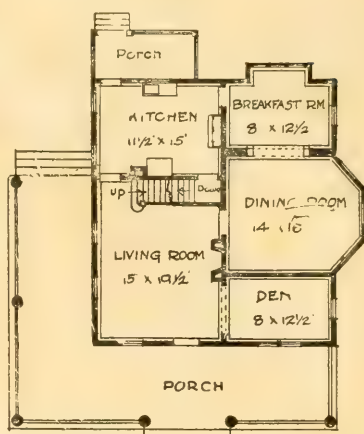
An itemized list of the cost is here given:

Excavation	\$100
Stonework	150
Brickwork	100
Carpenter work	400
Plastering	200
Lumber	425
Millwork	350
Painting and Glazing	200
Plumbing, etc.	225
Hardware	85
Heating	125
Range	40
<hr/>	
Total	\$2,400





SECOND FLOOR



FIRST FLOOR

Not the Fault of the Bird.

"You're a swindler," exclaimed Mrs. Gobb, as she entered the bird store. "You're worse than a highway robber. You ought to be ashamed of yourself to cheat a poor, innocent woman the way you did. That parrot I bought of you last week is a fraud. You said it was a fluent talker and you charged me a big price for him too, and that bird hasn't said a single word since I got him. Not one word. Do you hear me? not—one—single—word!"

"Perhaps," suggested the bird fancier, "you didn't give him a chance."—*New York Globe*.

An Extensive Planter of Peas!

A congressman received almost daily letters from a constituent asking for garden seed, with emphasis on peas. The demand for peas got so heavy that the congressman was moved to write this letter:

"I am sending you a half dozen more packages of peas as requested. Say, what are you trying to do down there, plant the whole state in peas?"

The reply came a few days later. It read:

"No, I'm not planting them, but they make bully soup. Send along some more."—*New York Globe*.

Hepaticas.

On the sunny hillside are they found,
Close above the warm protecting ground;
Delicate and fragile baby blooms,
Fresh from the Springtime's busy looms.

—Emma Peirce.

SUNDAY SCHOOL TEACHER: "Did you ever forgive an enemy?" "Tommy Tuffnut: "Oncest." Sunday School Teacher: "And what noble sentiment prompted you to do it?" Tommy Tuffnut: "He was bigger dan me."—*Life*.

OLD GENTLEMAN: "Well, my boy, and when does your birthday come?" Boy (who has been cautioned not to fish for presents): "Oh, it passed by a long time ago—a year next Saturday."—*Melbourne Leader*.

Fashion has a stern decree
That jewels should at night be worn;
Nature laughs decrees to scorn,
And wears her jewels in the morn!
—Emma Peirce.

An elderly church warden, in shaving himself one Sunday before church time, made a slight cut with the razor on the extreme end of his nose. Quickly calling his wife, he asked her if she had any court-plaster in the house. "You will find some in my sewing basket," she said. The warden soon had the cut covered. At the church, in assisting with the collection, he noticed every one smile as he passed the plate, and some of the younger people laughed outright. Very much annoyed, he asked a friend if there was anything wrong with his appearance. "Well, I should think there is," was the answer. "What is that on your nose?" "Court-plaster." "No," said his friend, "It is the label of a spool of cotton. It says 'warranted 200 yards long.'"—*Pittsburgh Chronicle-Telegraph*.

A Remedy Against Bores.

The mayor of a Western town hit upon a novel scheme to rid himself of a bore who had pestered him for some time.

The mayor's doorkeeper was a good-natured, obliging chap, and he could never find it in his heart to turn the bore away. Just as sure as the mayor was in, the bore was certain to be admitted. One day the mayor determined to end the persecution. So he said to his doorkeeper:

"Henry, do you know why Smith continues to come here so regularly?"

"No, sir, I can't say that I do."

"Well, Henry, I don't mind telling you in confidence that he's after your job."

"From that day," says the mayor, "I saw no more of the bore."—*The Youth's Companion*.

For a five-year-old, Margie had traveled a great deal. One day her aunt remarked, "Through all her travels Margie seems quite happy and contented." "Yes'm" answered Margie. "No matter where I go I always find some dirt to play in."—*Christian Register*.

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WM. G. VINAL, A. M.

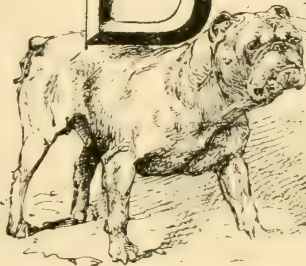
Rhode Island Normal School
Providence, Rhode Island.

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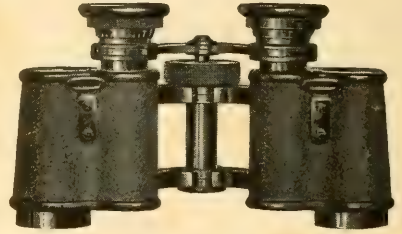
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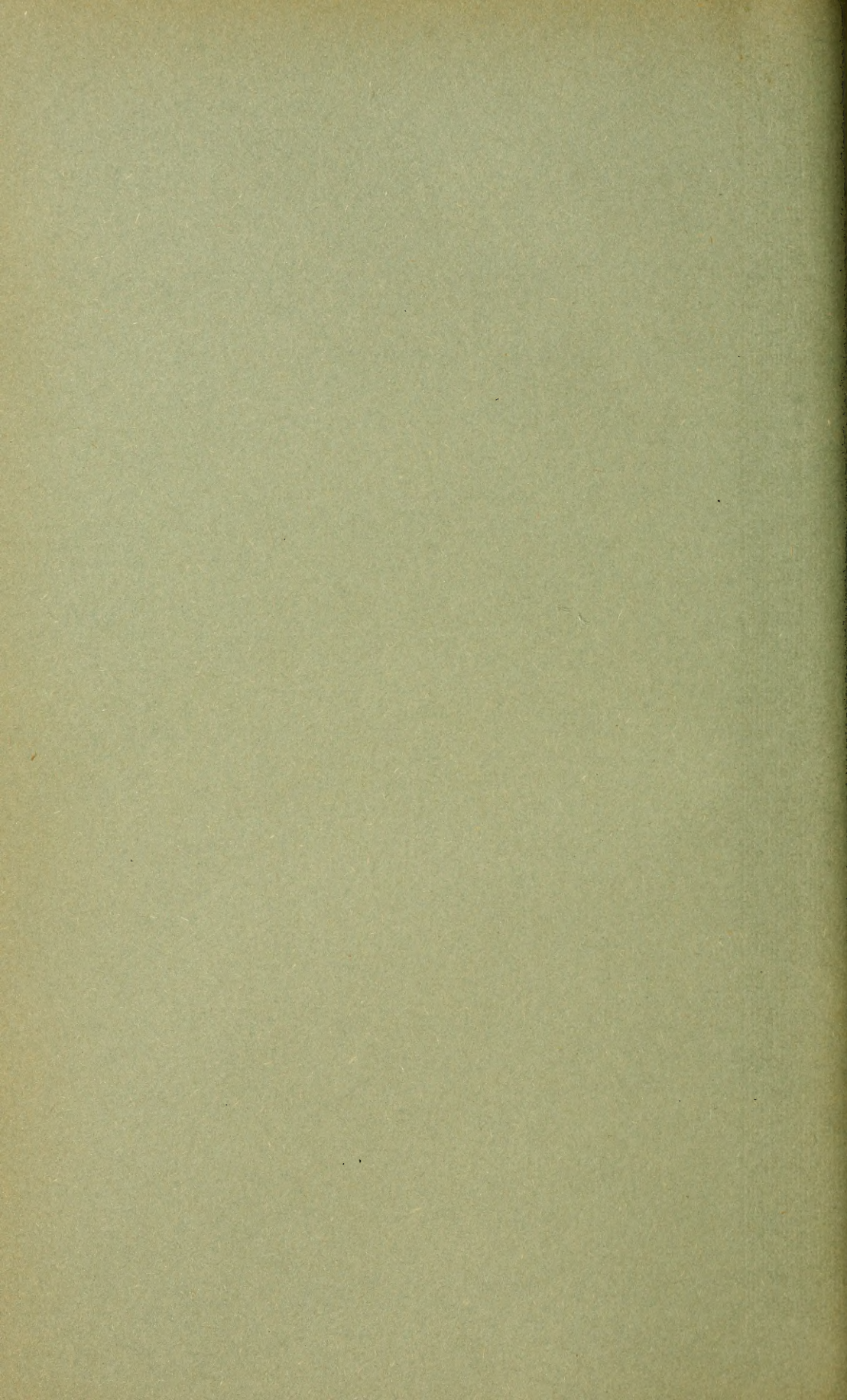
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